No. 4

CHEMICAL INDUSTRIES

Properties of
2-Methylpentadiene

Molecular weight	82.14
Specific gravity, 20°/20°C	0.720
Density, lb/gal @ 20°C	6.0
Index of refraction, N_D^{20}	1.4476
Freezing point	-75°C
Distillation range °C (95%)	74-76
Flash point, Tag open cup	-40°C

Miscible with most organic solvents

Immiscible with water

•

Samples of this new diene are available upon request

COMMERCIAL SOLVENTS
Corporation
17 EAST 42nd STREET, NEW YORK, N. Y.

The Nitroparaffins at Work will be featured in our exhibit at the National Chemical Exposition in Chicago, November 24th to 29th. You are cordially invited.

Caustic Soda keeps 'em flying!

Solvay Caustic Soda keeps 'em flying and rolling... by keeping the wheels of industry humming... for it is down deep in industry, before materials become machines... when rayon is still a liquid, when gasoline is coming from the crude, *that caustic soda is essential!*

SOLVAY SALES CORPORATION

Westvaco

CAUSTIC SODA

Uniformly High Quality

Prompt Delivery

LIQUID · FLAKE · SOLID

Westvaco CHEMICALS

WESTVACO CHLORINE PRODUCTS CORPORATION

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The Business Magazine for Makers & Users of Chemicals

Management, Research, Production, Marketing

CHEMICAL INDUSTRIES

Volume 51 — Number 4

Contents

OCTOBER, 1942

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THE READER WRITES

That Washington Merry-go-round

This letter is written in response to a paragraph in Chem-O-Gram, in the August, 1942 issue of CHEMICAL INDUSTRIES.

It is written with a two-fold purpose in mind. First, to give you concrete information as to the difficulties being faced by a small business man who wishes to participate in the defense program. Second, with the hope that your multiple sources of information may make it possible for you to suggest a method of approach which we may have overlooked.

For the past eight years we have been doing business with the United States Government on peace-time projects, dealing with the Procurement Division of the Treasury Department and the Public Buildings Administration. Over a year ago we started making visits to Washington, contacting Army and Navy officials with the idea of developing business with the Army and Navy Departments.

I have contacted perhaps fifty officials in the Army and Navy Departments during my several visits to Washington. I have found all of these officials receptive to the ideas I presented, but *none of them seem to have authority to say either yes or no.*

I present, herewith, a verbatim report of a single day's activities in Washington:

9:00 A. M.: Visited Congressman's office. Congressman in question had, prior to my visit, contacted liaison officials for the House of Representatives and the Army and Navy Departments. This liaison official had given the Congressman, after considerable correspondence, the name of an Army official and the name of a Navy official "responsible for water treatment problems." The Congressman's secretary made an appointment for me to see the designated Navy official at once. She was unable to locate the designated Army official until the following day.

I visited the Navy official who stated that he was not the man for me to see. He took me to an adjoining office and introduced me to Navy officials A and B. B then took me to another office and introduced me to Navy official C. C then introduced me to D. D introduced me to E. E introduced me to F. By the time I had reached F it was 5:30 P. M., and I had been unable to extract a "yes" or a "no" from any of the men interviewed.

The following morning I was able to obtain the address of the designated Army official, and an appointment was made. On reaching his office he stated that he was not the man for me to see, and took me to an adjoining office and introduced me to official H. H took me to official I. Official I introduced me to official K. Official K introduced me to official L. Official L introduced me to official M. Official M turned out to be a man I had interviewed a month previous. Official H later introduced me to officials N and O. Official N introduced me to official P who also turned out to be a man I had interviewed a month previous. I found every one of these men receptive, but none in a position to say "yes" or "no."

In the case of these interviews, and in the case of prior interviews, I told the official in question that I would appreciate it if he would advise me that I was wasting my time in Washington and had best return to New York. The uniform reply would be, "No, I think you ought to see this thing through. What you have to sell is needed, but it happens that I do not have authority to make the decision in re same. If you keep on trying you will doubtless locate the man responsible for making decisions in this matter."

For your information as to my responsibility, I enclose reprint of biographical sketch from Who's Who in Engineering. I have been a subscriber to CHEMICAL INDUSTRIES for many years.

I do not wish to unduly trespass upon your time, however, I would appreciate any comment you may wish to make, or would be glad to come in and discuss the problem with you.

Editorial Note: *For obvious reasons the name of the writer is withheld. The editors of* CHEMICAL INDUSTRIES *sincerely wish they knew the solution to this problem—but frankly they do not. The magnitude of the war undertaking is such that it is very difficult to set up organizations that function as smoothly as all of us would like to have them do. All we can say is—keep trying! Incidentally that is just what we have to do although we'll admit it is pretty discouraging at times.*

CALENDAR OF EVENTS

Oct. 14, International Acetylene Association, Annual Business Meeting, Cleveland Hotel, Cleveland, O.

Oct. 12-16, National Metal Congress & Exposition, Detroit, Mich.

Oct. 15, New England Paint & Varnish Production Club, Hotel Vendome, Boston, Mass.

Oct. 15-16, Tanners' Council of America, Annual Meeting, Palmer House, Chicago, Ill.

Oct. 19, Utah Paint, Varnish & Lacquer Assn., Monthly Meeting, Ambassador Hotel, Salt Lake City, Utah.

Oct. 22-24, American Water Works Assoc., Missouri Valley Section, Coronado Hotel, St. Louis, Missouri.

Oct. 23, N. Y. Chapter, American Institute of Chemists, Dinner to Pres. G. Egloff, Chemists' Club, New York, N. Y.

Oct. 25-29, National Electrical Mfrs. Assn., Annual Meeting, Waldorf-Astoria Hotel, New York, N. Y.

Oct. 26, Association of Consulting Chemists & Chemical Engineers, Inc., Council Meeting, The Chemists' Club, New York, N. Y.

Oct. 26-28, National Pest Control Association, Tenth Annual Convention, William Penn Hotel, Pittsburgh, Pa.

Oct. 27, Association of Consulting Chemists & Chemical Engineers, Inc., Annual Meeting, The Chemists' Club, New York, N. Y.

Oct. 27, Oil Trades Association of N. Y. Inc., Annual Banquet, Waldorf-Astoria Hotel, New York, N. Y.

Nov. 4, American Institute of Consulting Engineers, Luncheon & Council Meeting, City Midday Club, New York.

Nov. 5, Indianapolis Paint, Varnish & Lacquer Assoc., Regular Monthly Meeting, Columbia Club, Indianapolis, Ind.

Nov. 5-7, American Trade Assoc. Executives (Annual Meeting), Hotel Pennsylvania, New York, N. Y.

Nov. 6, American Chemical Society's New York Section and Society of Chemical Industry, Society of Chemical Industry in charge, New York City.

Nov. 9-10-11, The National Fertilizer Association, 18th Annual Southern Convention, Biltmore Hotel, Atlanta, Ga.

Nov. 9-13, American Petroleum Institute, 23rd annual meeting, Stevens Hotel, Chicago, Ill.

Nov. 10-12, American Management Assoc., (Production Conference), Hotel New Yorker, New York, N. Y.

Nov. 12-13, The Associated Cooperage Industries of America, Inc., Semi-Annual Convention, Peabody Hotel, Memphis, Tenn.

Nov. 16, Utah Paint, Varnish & Lacquer Ass'n, Monthly Meeting, Ambassador Hotel, Salt Lake City, Utah.

Nov 16-18, American Institute of Chemical Engineers, 35th Annual Meeting, Netherland Plaza Hotel, Cincinnati, O.

Nov. 19, Chicago Drug and Chemical Assoc., Monthly Luncheon, Union League Club, Chicago, Ill.

Nov. 19, New England Paint & Varnish Production Club, Hotel Vendome, Boston, Mass.

Nov. 21, Chicago Chapter, American Institute of Chemists, Dinner in honor of Prof. V. N. Ipatieff.

Nov. 30, Association of Consulting Chemists & Chemical Engineers, Inc., Council Meeting, The Chemists' Club, New York, N. Y.

Nov. 30-Dec. 1, National Industrial Council, Waldorf-Astoria Hotel, New York, N. Y.

1st wk. of Dec. Chemical Section of National Safety Council, Annual Meeting, New York City.

Dec. 2, American Institute of Consulting Engineers, Luncheon & Council Meeting, City Midday Club, New York.

Dec. 2-4, National Association of Manufacturers and the Congress of American Industry, Waldorf-Astoria Hotel, New York, N. Y.

Dec. 3, Indianapolis Paint, Varnish & Lacquer Assn., Regular Monthly Meeting, Columbia Club, Indianapolis, Ind.

Dec. 2-4, National Association of Manufacturers and the Congress of American Industry, Waldorf-Astoria Hotel, New York.

Dec. 3, Indianapolis Paint, Varnish & Lacquer Assoc., Regular Monthly Meeting, Columbia Club, Indianapolis, Ind.

Dec. 4, Society of Chemical Industry, Regular Meeting, The Chemists' Club, New York, N. Y.

Dec. 7-8, National Ass'n Insecticide & Disinfectant Mfrs., Inc., Annual Meeting, Hotel Roosevelt, New York, N. Y.

Dec. 10, American Standards Assoc. (Annual Meeting), Hotel Astor, New York, N. Y.

Dec. 11, American Chemical Society's New York Section, New York City.

Dec. 12, Chicago Perfumery, Soap and Extract Assn. Christmas Party, Grand Ballroom, Hotel Sherman, Chicago, Ill.

Dec. 15, Maryland Section of American Institute of Chemical Engineers, General Meeting, Blackstone Hotel, Baltimore, Md.

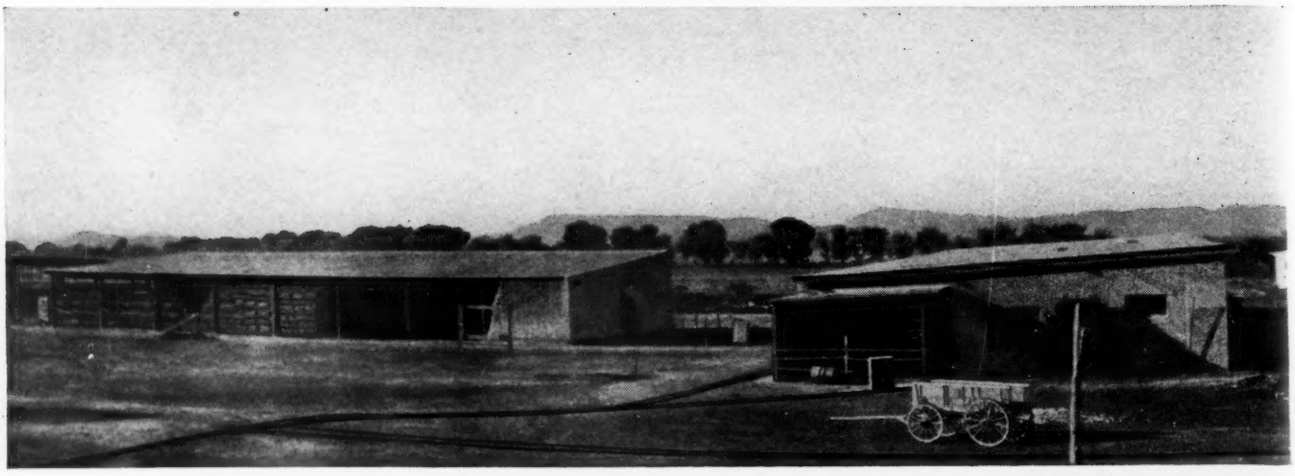
Dec. 17, Chicago Drug and Chemical Assoc., 40th Annual Christmas Banquet, Drake Hotel, Chicago, Ill.

Dec. 17, New England Paint & Varnish Production Club, Hotel Vendome, Boston, Mass.

Dec. 18, American Chemical Society, New York Group (Rubber Div.), Building Trades Club, New York, N. Y.

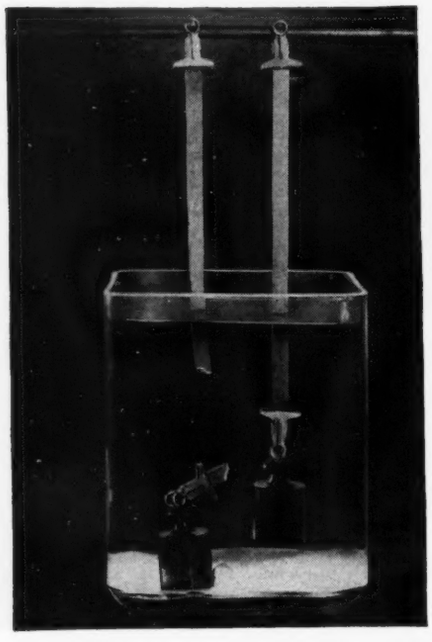
Dec. 21, Utah Paint, Varnish & Lacquer Ass'n, Monthly Meeting, Ambassador Hotel, Salt Lake City, Utah.

Dec. 28, Association of Consulting Chemists & Chemical Engineers, Inc., Council Meeting, The Chemists' Club, New York, N. Y.



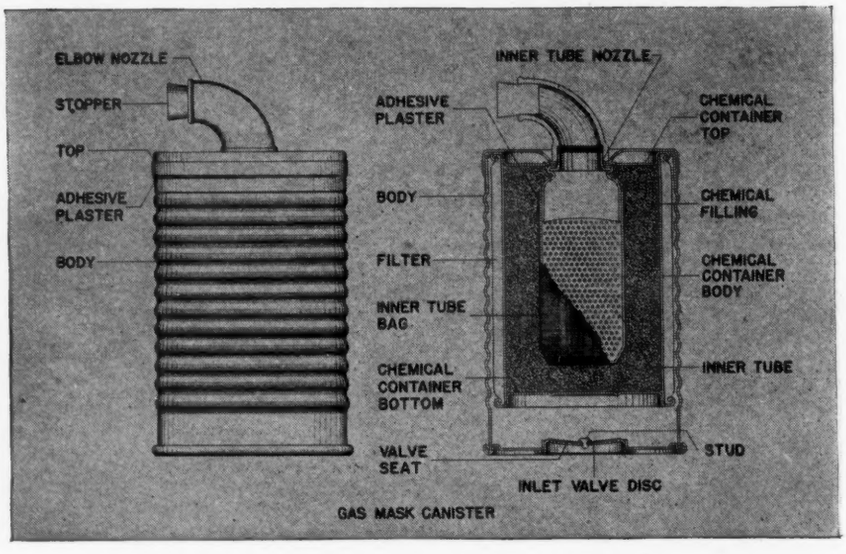
(*Above*) **GUAYULE RUBBER,** processed in plants like the one shown in panoramic views, has entered an outstanding new phase of industrial utility as a tackifier and extender for Buna S. As sales agents for Parras washed and dried Guayule distributed by Rubber Reserve Company, the American Cyanamid Company is now offering this product to American industry.

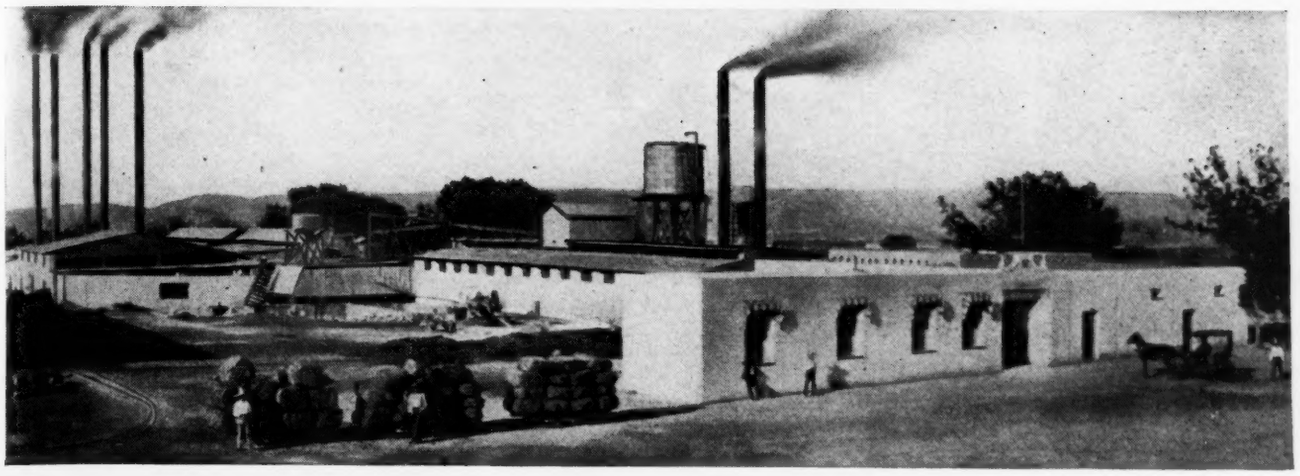
LIFE ON THE CHEMICAL NEWSFRONT

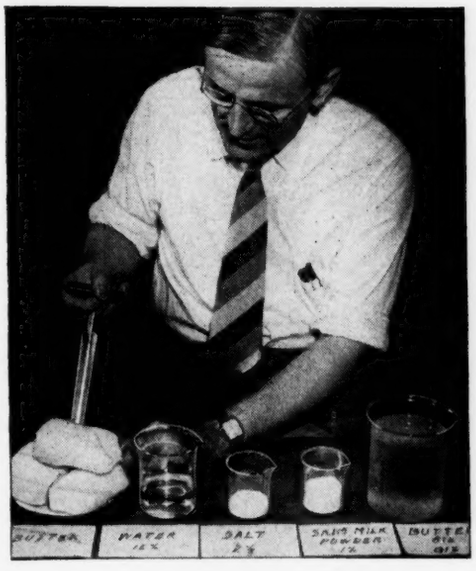


(*Above*) **WET STRENGTH TESTS** on paper show effectiveness of a new Cyanamid synthetic resin known as Paper Resin No. 605. Both papers have identical weights attached to submerged end. Unbroken strip at right is stock made with new resin, and continues to hold weight after days of immersion. Strip at left, which had not received any wet strength treatment, broke after 3 minutes' submersion.

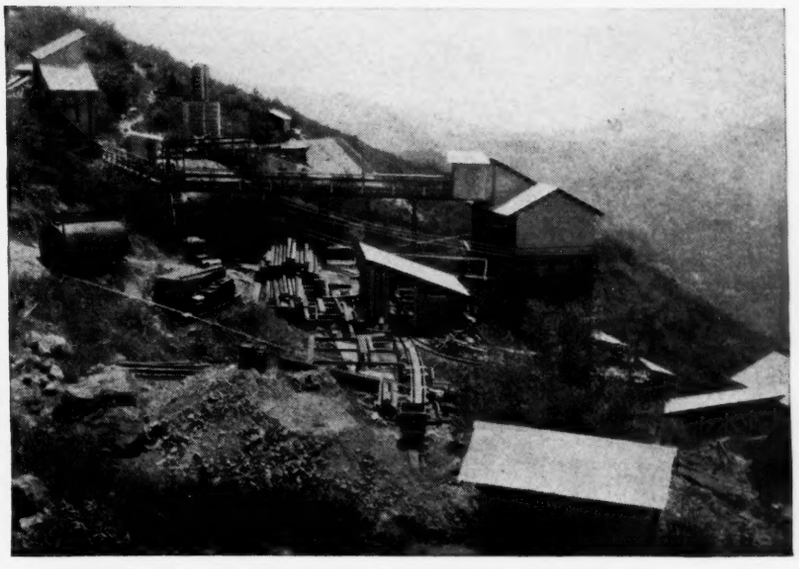
(*Right*) **HOW A GAS MASK FILTER WORKS** is readily understood from an examination of these external and cross-section views of the canister construction. The chemical filling which filters out gas by absorption is usually a specially activated coconut shell carbon. Every purchase you make of a $25.00 War Bond will supply 9 of these canisters for the armed forces.







(*Above*) **BUTTER FOR THE TROPICS** can be safely shipped in the form of butter oil and skim milk powder, dehydrated products which contain all the food nutrients found in butter. C. S. Trimble, of the Department of Agriculture, shows how the butter oil and milk powder can be compounded into good butter with the aid of water and salt.



(*Above*) **NEW LEVELS OF SAFETY** have been attained in mercury mining operations, by spraying the mine with calcium polysulphide. This inexpensive chemical treatment, devised by Professor Merle Randall, Department of Chemistry, University of California, is reported to have proved highly efficacious in reducing mercury vapor concentration in the mine, and thus removing any serious health hazard. It is reported that there is no risk of generating hydrogen sulphide, provided alkaline conditions are maintained. Photo shows typical quicksilver mine.

(*Right*) **CHEMICALLY TREATED WOOD CONSERVES STEEL.** Wood impregnated with certain chemicals to render it highly fire-resistant is being used in increasing quantity in industrial construction—releasing steel for other vital purposes. Among the chemicals currently used in the preparation of fire-retardant formulas are ammonium sulfate, ammonium phosphate, borax, boric acid, and zinc chloride. Photo shows use of treated wood in construction of a western aircraft plant, one of many projects in which this useful material is being employed. Thus through the use of chemicals, one of the oldest of materials is given new utility and value in meeting the needs of man.

WASHINGTON

By T. N. Sandifer

IT is regarded at this stage as more than possible that those more vocal Washington speakers who still think the country is "complacent" are in for a surprise in the Congressional elections now drawing near.

A distinct uneasiness has been reported among Administration men over the outcome, though nobody here expects an upset. However, there is a growing indication of a certain restlessness among the voters, and the more hopeful anti-Administration elements are looking for a distinct gain in strength—that is, they expect some Democratic seats to change party occupants.

T. N. Sandifer

The voters have been kept stirred up in recent months by constant references to their "smugness" and their failure to realize that a war is on. Those who harp on these themes have evidently overlooked the possibility that audiences over the country now contain substantial blocks of those whose sons, fathers, or other relations are in the service, and perhaps casualties on one or another action front. Also increasing numbers of people are feeling the tax pinch, or anticipating it, and are being further warned of new and as yet unspecified hardships.

There is evidence that when alarmist speakers now mention that "we" are losing the war, the tendency of some such members of the audience is to ask who they mean by "we"; logically they are beginning to remember that the speakers usually are among those charged by the public with the job of seeing that the war is not lost. Therefore if "we" are losing, the inclination is to ask why, and if the answer is not satisfactory, to try to do something about it.

That is one explanation around Washington for the expectation of some new opposition seats in Congress. Dissatisfied voters are expected to take their irritation to the polls.

Forecasts of yet more grief to come, and frank confessions that the Administration is just waiting until after the votes are in to spring whatever unpleasantness is at hand, are conceded now not to be helpful, politically. There is still uncertainty over the draft program, with even Congress seemingly befogged over the various statements.

Also in the near future is a much more extensive rationing program, and an increasing impact of war on smaller business enterprises; the Presidnet himself is harping on further cuts in civilian output, while increasing talk is heard now of the forthcoming manpower legislation.

The shake-up of the war machinery at Washington is moving about as expected—piecemeal. Changes are taking place almost daily in the war production set-up, but no over-all change as yet. A tremendous volume of orders affecting the chemicals field is being ground out, but the outlook is for more and more emphasis on allocations outright, rather than continued adherence to priority rating systems.

In this connection glycols will go under complete allocation control in October, effective from the first of the month. The purpose of the order, among several aims, is to encourage substitution of glycols for glycerine in a wide range of uses. Production facilities for glycols are regarded as ample, so that increased production hinges on raw materials supply.

Chemicals Branch has been augmented by a new Drugs and Cosmetics section, which is headed by F. J. Stock, formerly with Walgreen Drug Company, Chicago. He has been serving as deputy chief of the Health Supplies Branch, which recently was transferred to the Chemical Branch.

Deputy chief of the Drugs and Cosmetics unit is C. A. Willard, former chief of the Cosmetics Branch. Consultants named by Dr. E. W. Reid, who heads all chemical activities of WPB, include: Floyd Thayer, Dr. A. B. Pacini, John Williams, and Dr. Dan Dahle.

Unit chiefs include;

Biologicals and Medical Chemicals, J. T. Batson; Botanicals and Imports, T. F. Currens; Vitamins and Agar, Mark Merrell; Cosmetics, Robert Blair.

This section dealing with Drugs and Cosmetics, it was stated, has assumed functions previously under Drugs and Pharmaceuticals section of the Old Health Supplies Branch and the Toiletries and Cosmetics Branch. The consolidation, first announced in September, was intended to include in a single organization under WPB, all chemical products.

Additional Appointments

Robert Blair, one of the above-mentioned unit chiefs, was later designated also as government representative for a newly formed transportation advlsory committee for the Toiletries and Cosmetics industry.

E. H. Bucy, chief of the Protective Coatings Section, Chemicals Branch, was designated government representative on two advisory groups, an advisory committee for the Carbon Black Manufacturers, and one for the Paint, Varnish and Lacquer Industry, personnel of which were announced during the month.

R. B. Ladoo, chief of the Mica-Graphite Branch, was named in a similar representative capacity on an advisory committee for the refractory magnesite industry.

As forecast in a previous issue ("Between the Lines," Sept.) the increasing pressure on chemical fertilizer components has led to action in various directions at WPB, and in other Washington agencies. The WPB has ordered national conservation measures affecting chemical fertilizers, to save nitrogen for more vital war uses.

Extensive rationing provisions were put in effect by Order M-231, which however, was drawn to encourage use of organic nitrogen; the only restriction on manufacture, sale or use of fertilizers containing this substance related to specified minimums.

M-231 was subsequently amended to permit unlimited use of nitrogen-bearing fertilizers by the armed services for new plantings of grass on airports or airfields.

In the same general category of essential agricultural supplies, WPB issued M-227, placing copper chemicals under complete allocation control. The announced object was to conserve copper scrap from which such chemicals are made. However the order covered copper sulfate, carbonate, chloride, oxide, nitrate, and cyanide, which are permitted for a wide variety of uses in the order, but are to be issued strictly according to plan hereafter.

(*Continued on page 621*)

SYMBOL of FREEDOM

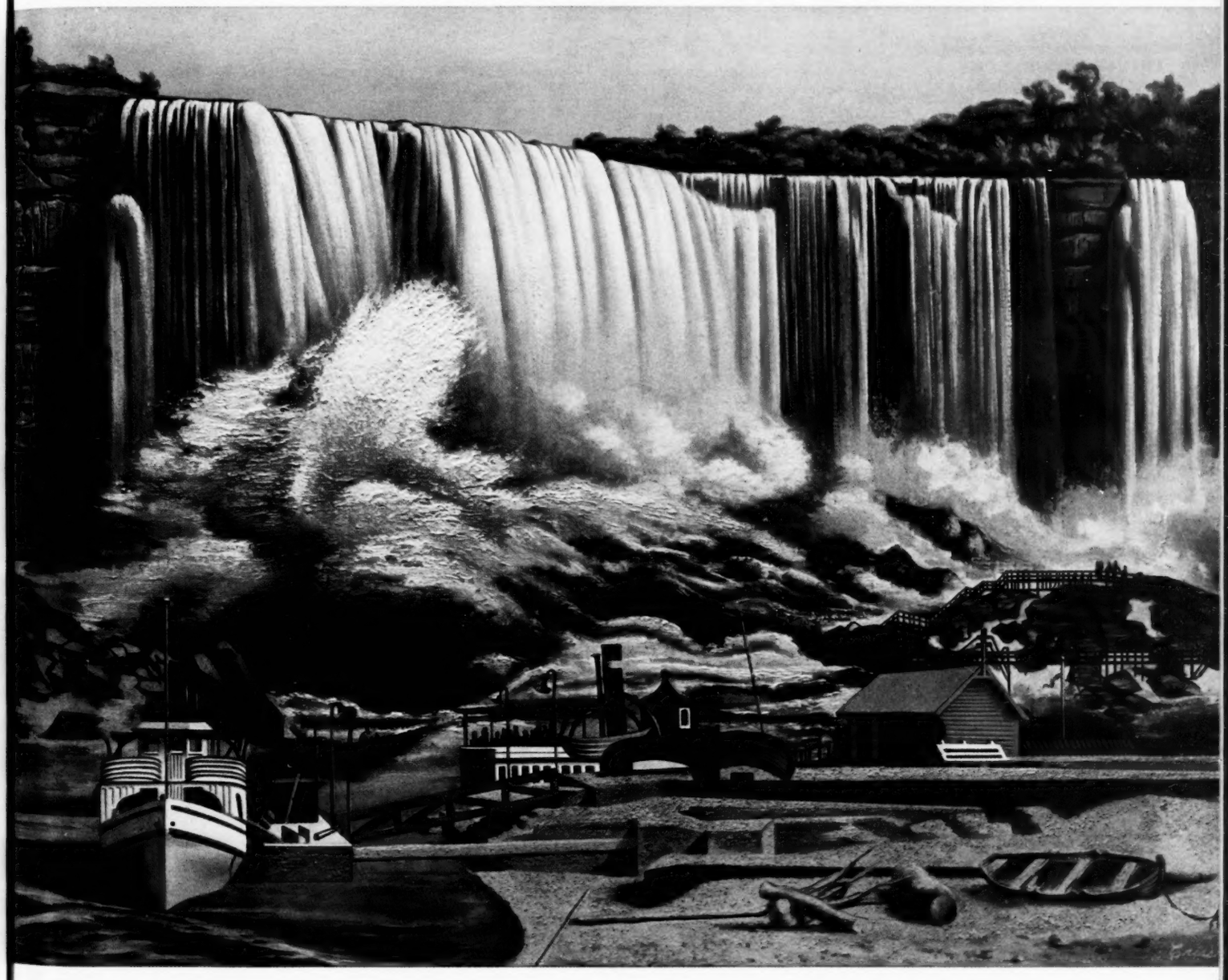
Silent and awestruck stood the early explorers and adventurers who dared the wilderness to gaze upon the great Falls at Niagara. And year by year in story and legend its fame grew—until Niagara became a symbol of a great and glorious new country. Free, untamed, resistless, it spoke in resounding tones of a land of far reaching spaces...broad rivers... tall mountains... fertile valleys... and boundless opportunities.

Like the river at Niagara, a stream of humanity broke away from its ancient, sluggish ways. It plunged into swift-moving rapids. It flowed through the hills and valleys of America. It built cities and farms, turned desert waste into rich farm lands, created mills and factories, gave birth to a new and better way of life for which we are all fighting and working today. And still this river of humanity flows on! The truth of its progress and its ideals are echoed throughout the world. And still Niagara flows on—symbol of the restless energy, the limitless abundance that is America.

We who work within sight and sound of Niagara Falls are devoting every ounce of our energies and facilities to speeding the flow of Chemicals for Victory.

CAUSTIC POTASH · CAUSTIC SODA
PARA · CARBONATE OF POTASH
LIQUID CHLORINE

FROM THE ORIGINAL BY FRANCIS CRISS... IN NIAGARA ALKALI COMPANY'S COLLECTION OF PAINTINGS OF NIAGARA FALLS



NIAGARA ALKALI COMPANY

Niagara ALKALI COMPANY

60 EAST 42nd STREET, NEW YORK, N. Y.

LAST MINUTE NEWS AT PRESS TIME DIGESTED FOR C.I. READERS

CHEMICAL INDUSTRIES

CHEM-O-GRAM

WASHINGTON PRICES PRODUCTION PERSONNEL

OPA SIMPLIFIES REPORT FORMS

WASHINGTON, Oct. 10—Uniform license and registration provisions for distributors of chemicals were written into 14 price regulations and schedules by the Office of Price Administration today as a result of a report by a committee for the Review of Data Requests from Industry under the chairmanship of Joseph I. Lubin. By the same action, 120 War Production Board report forms have been completely eliminated and 132 improved and simplified. Further improvements are expected, as needed.

RUBBER INDEPENDENCE BY 1944

CHICAGO, Oct. 5—Speaking before the Midwest Section of the American Association of Cereal Chemists, Dr. Herbert A. Winkelmann, Dryden Rubber Co., predicted that by 1944 we will be independent of natural rubber sources and the chances are there will be such control of synthetic rubber that never again will we be as vulnerable as we have been. The law of supply and demand, he told the group, will determine how much actual rubber and how much synthetic will be used in the post war period.

MORE FATS & OILS PRICES SET

WASHINGTON, Oct. 11—The Office of Price Administration today set specific dollar and cent prices on wool grease, raw soap stocks, recovered or acidulated soap stocks, distilled fatty acids and stearic and oleic acids. Previously these prices had ceilings set either by their Oct. 1, 1941 price or 111% of their Nov. 26, 1941 price, whichever was higher. The new specific ceilings follow the general policy of eventually replacing ceiling prices for some 125 major fats and oils with definite maximums.

GREATER PLASTICS PRODUCTION URGED

RYE, N. Y., Oct. 12—The plastics industry, which trebled its production between 1933 and 1939 and doubled it between 1939 and 1941 must expand to even greater levels, speakers at the Fall convention of the Society of the Plastics Industry reported here today. Greater production, they said, must be attained to replace scarce materials in the war effort and to help close the inflation gap.

PERSONNEL ADDITIONS

Miss Esther A. Engle has been engaged by the technical service division of Commercial Solvents Corp., Terre Haute, Ind. Before joining the staff she was head of the chemistry department of Cedar Crest College, Allentown, Pa. . . . R. G. Verdieck and William C. Eastin have joined the staff of the research and development department of Westvaco Chlorine Products Corp., N. Y. City.

LAST MINUTE NEWS AT PRESS TIME DIGESTED FOR C.I. READERS

CHEMICAL INDUSTRIES

CHEM-O-GRAM

WASHINGTON PRICES PRODUCTION PERSONNEL

NEW LOCATION PLANNED

CHICAGO—Le Val Filter Co., now located at 1319 N. Michigan Ave. will move to new quarters Nov. 1 at 925 Wrightwood Ave. New Plant is about three times the size of the present one.

GREENAWALD ADDRESSES PAINT CLUB

CINCINNATI, Oct. 12—F. S. Greenawald, Nuodex Products Co., Elizabeth, N. J., spoke before the Cincinnati, Dayton, Indianapolis, Columbus Paint & Varnish Production Club tonight on "Comparative Efficiency of Driers at Elevated Temperatures." In his talk, he released a compilation of data obtained over a year-and-a-half of research.

PAINT PRODUCTION SURVEY

WASHINGTON—A survey is now under way to determine the feasibility of using any surplus production capacity which may exist or later develop in the paint industry for the production of war materials other than paint, varnish and lacquer products. The National Paint, Varnish & Lacquer Association, which is making the survey, has engaged H. Wachsmann, Industrial Engineer, to make the investigation and submit a report. Paint industry equipment could be used for many chemical processes such as making or blending solutions, pastes, emulsions and mixtures. Container filling equipment could be used, too. Suggestions are welcomed by the association which is at 1500 Rhode Island Ave. Make them by mail rather than personal visit, though.

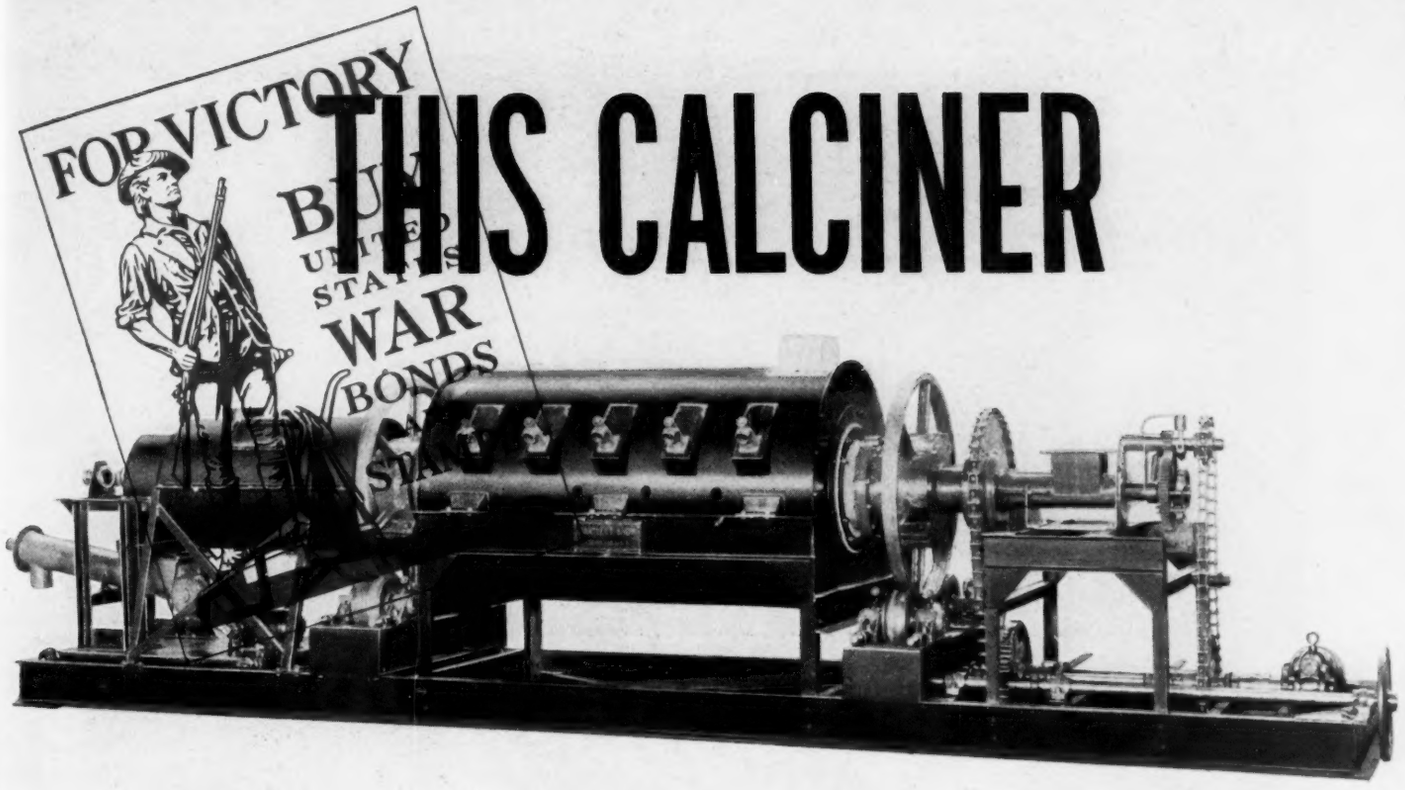
MARKETS ACTIVE

NEW YORK, Oct. 14—Some shipments of chemicals are going out for export against licenses granted by Export Control in spite of tight shipping space conditions. Fertilizer manufacturers are getting their ammonium sulfate and sodium nitrate contract deliveries. Superphosphate production is on the upgrade. Considerable amounts of phenol are being shipped under lend-lease. Coal tar crudes are very limited in supply. August paint sales were down 15.5% under the same month last year. A new product will appear shortly, price yet unknown, containing approximately 75% menthol derived from American peppermint oil. Ascorbic and citric acids are in tight position.

WANT CONTAINER RESEARCH

WASHINGTON, Oct. 15—The Containers Branch of the WPB today warned that critical materials for the manufacture of containers are becoming increasingly scarce and appealed urgently to the industry for concentration of research facilities on the development of usable substitutes. There have been many substitutes developed, it was pointed out, but the proportion of containers still made of critical materials is still in excess of what it should be in the light of the present military demands.

THIS CALCINER



translates *theory into practice*

● To take an inexpensive organic material specified by the customer . . . to calcine it at high temperatures in a reducing atmosphere . . . to get the required product with just the yield desired . . . seemed possible in theory, although it had never been done before, but

Bartlett-Snow did it with 100% Results

Based on Bartlett-Snow theoretical calculations, Bartlett-Snow design and heat engineering, and constructed in Bartlett-Snow's completely equipped machine and structural shops, this indirect heat calciner has met every operating condition. Every prediction and every expectation has been entirely fulfilled.

Special Construction

From the receiving hopper the material is passed by a motor driven, but instantly variable and volumetrically exact screw feeder, capable of handling from 29 to 748 pounds per hour, into a specially cast high nickel-chrome tube, guaranteed to withstand temperatures of 2000°F., when in continuous use. In the reducing atmosphere of this air tight, gas tight chamber, the material is broken down . . . gaseous products are released through a water-jacketed outlet, and the solid material, first cooled to normal temperatures, is discharged continuously at the desired rate per hour.

Use Bartlett-Snow Experience

Equipped with auxiliary manual driving mechanism to insure the safety of the calcining tube in case of current failure, with sanitary air-cooled riding rings and with discharge equipment mounted on a traveling and counterweighted frame, that compensates the 1⅛-inch expansion of the nickel-chrome calcining tube . . . this installation proves again the ability of Bartlett-Snow engineers to master even the most severe heat engineering problems . . . What is your problem?

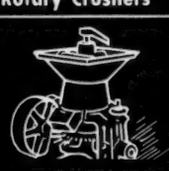
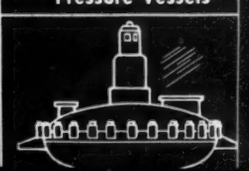
THE C. O. BARTLETT & SNOW COMPANY
6207 HARVARD AVENUE, CLEVELAND, OHIO
30 Church St., New York — First Nat'l Bank Bldg., Chicago

100% War Bond Buyers
Average Payroll Deductions 14%
U.S. Treasury

BARTLETT-SNOW

DRYERS • CALCINERS • COOLERS • KILNS

Also complete materials handling facilities to meet any requirement
One contract • One guarantee of satisfactory performance • Unit responsibility

Screw Feeders	Rotary Crushers	Bucket Elevators	Belt Conveyors	Dust Collectors	Pressure Vessels
					

Acid-resistant PROOF

Good reasons for changing to General Ceramics Chemical Stoneware

General Ceramics Chemical Stoneware guards against corrosion and replaces hard-to-get materials. Here's a line of stoneware that's acid-proof through and through, not merely surfaced with a corrosion-resistant.

From smallest jug to largest vat, General Ceramics' diamond trademark identifies material completely impervious to all chemicals, hot or cold, excepting only hydrofluoric acid. Check these typical advantages of General Ceramics Chemical Stoneware:

- **Freedom from leakage** with greater safety to employees, less danger to property.
- **Easily maintained cleanliness,** with resulting protection against product contamination.
- **Greater Durability** and length of service.

Our latest bulletin describes and illustrates the types of General Ceramics Stoneware best suited for your needs. Would you like a copy?

GENERAL CERAMICS CO.

KEASBEY, NEW JERSEY

GENERAL CERAMICS COMPANY
CHEMICAL STONEWARE

NEW YORK, 30 Broad Street; BUFFALO, 306 Jackson Building; SAN FRANCISCO, 598 Monadnock Bldg; CHICAGO, 208 South La Salle St.; SEATTLE, 1411 Fourth Ave. Bldg.; LOS ANGELES, 415 South Central Ave.; SPOKANE, 3219 Wellington Place; PORTLAND, 3019 N. E. 26th Ave.; TACOMA, Tacoma Bldg.; MONTREAL, Canada Cement Building; TORONTO, Richardson Agencies, Ltd., 454 King Street, West.

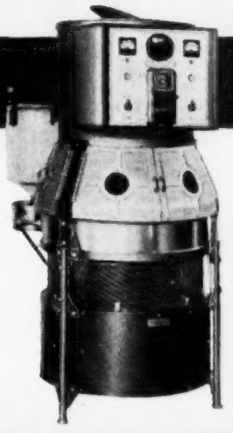
2845

ATLAS-OMETERS

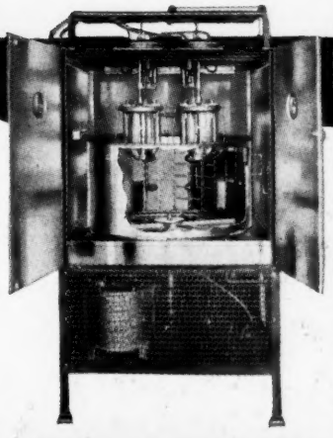
ACCELERATED TESTING EQUIPMENT

for predetermining in the laboratory the effects of Sun, Weathering and Laundering on all types of products—textiles, papers, dyestuff, plastics, metals, bitumens. Federal Specifications call for testing with Atlas-Ometers.

FADE-OMETER



● For determining the fastness to light of dyestuff and dyed fabrics, specimens are rotated around the Atlas Enclosed Violet Carbon Arc—the closest approach to natural sunlight. Temperature automatically controlled. Available for A. C. or D. C. service.



WEATHER-OMETER

● Reproduces faithfully the destructive action of the sun, rain, thermal shock—with all the attendant phenomena of expansion and contraction. All phases of operation and testing automatically controlled. Made in two models the standard single arc and the new double arc for faster testing. Available for A. C. or D. C. operation.

LAUNDER-OMETER

● The standard laboratory washing machine for the A.A.T.C.C. for testing textiles for color fastness, staining, shrinking, resistance to washing. Testing leather dyes, vat and sulphur dyes, dry cleaning solvents, soaps and detergents. All operating factors carefully controlled. Available for steam, gas or electric heat. Made in several sizes.

ATLAS ELECTRIC DEVICES CO., 347 W. Superior St., Chicago

ATLAS-OMETERS Accelerated Testing Equipment


ZIRCONIUM
in industry
Today, Defense and non-defense manufacturing has emphasized the ever-increasing uses and possibilities of the element ZIRCONIUM and its compounds in industry. TAMCO Zirconium compounds are being used successfully in the manufacture of Refractories, Electrical Resistors, Resins, Dye Extenders, Water Repellents, Catalysts, Abrasives, and Ceramics.
TAMCO'S development engineers and research laboratories have long been cooperating with the industry. Write today, for a TAM resident field engineer to call at your plant and discuss the potential use of Zirconium Compounds with you.
TITANIUM
ALLOY MANUFACTURING COMPANY
TAMCO PRODUCTS INCLUDE
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EXECUTIVE OFFICES: 111 BROADWAY, NEW YORK CITY

KNIGHT-WARE
for
SOLID DEFENSE AGAINST CORROSION

● **MATERIALS:**—Knight-Ware is entirely acid proof, not just resistant, all the way through. It will handle any concentration of liquid or gas, hot or cold, except caustic soda or HF acid without corrosion or product contamination. Various material mixtures are used ranging from a porous body to a dense flint-like structure to best meet physical service requirements.

Pyroflex, a thermoplastic resin, has chemical resistance similar to rubber. It is used alone or in conjunction with Knight-Ware for lining steel or concrete equipment for chemical service.

● **FORMS:**—Knight-Ware is made by experienced craftsmen in standard and special shapes such as pipe, valves, jars, filters, kettles, pans, coils, manifolds, tanks, towers and tower packings. Methods of manufacture permit modified or special forms of equipment to be made at comparatively low cost.

Large equipment such as gas scrubbers, concentrators, storage tanks and neutralizers are available of steel lined with Pyroflex and Knight-Ware tile for dependable service. Other material combinations such as Pyroflex impregnated glass fabric or stoneware, Pyroflex and carbon are used to best meet particular service requirements.

● **SERVICE:**—Years of manufacturing experience, intimate knowledge of the chemical industry and a progressive management are your guarantees of quality chemical equipment that will stand up in service.

MAURICE A. KNIGHT

Cook Settlement Street, Akron, Ohio **55 W. 42nd Street, New York**

To Help You Plan Wisely . . . Now!

IN striving to meet the seemingly impossible production requirements and changed processes imposed by the war, many American Manufacturers are keenly aware of the inadequacy of their present equipment. The major problem, in most cases, is one of equipment conversion . . . to meet today's needs with yesterday's equipment; and still plan for tomorrow.

To solve such problems successfully often requires more than a conference of plant executives. It's a job for men who have served the whole processing industry; and who are therefore abreast — or even ahead of the times, in creative design. This is a job requiring the combination of both expert technical advice and adequate research facilities.

The BUFLOVAK Technical Staff brings a broad knowledge and viewpoint to help solve your processing problem. The soundness of proposed new methods can be proven beyond all doubt, by putting the process into actual operation on a semi-plant scale in the BUFLOVAK Research Laboratory and Testing Plant. Complete equipment is available for drying, evaporation, impregnation and other processing operations, on a basis that gives accurate indexes to all production factors.

Here's an example: Recently, the BUFLOVAK Laboratory completed a 30-day continuous test for a large manufacturer. As a result, he is now producing a better product by a different method and has solved today's new packaging problem.

There is no obligation in submitting your problem to BUFLOVAK. Write today for complete information.

BUFLOVAK designs and builds Autoclaves, Dryers, Evaporators, Flakers, Impregnators, Solvent Recovery Equipment, Chemical Plant Equipment.

PLAN TODAY ...

BUFLOVAK

for TOMORROW

BUFFALO FOUNDRY AND MACHINE COMPANY **BUFFALO, NEW YORK**

DOW CAUSTIC SODA

THE UNIVERSALLY USEFUL CHEMICAL

THIRD LARGEST USER OF NaOH HAS 3 EXACTING REQUIREMENTS

The Chemical Industry, third largest consumer of Caustic Soda, has rigid requirements in regard to the *quality* and *uniformity* of the Caustic Soda it uses. . . . Chemical processes of extraction and the synthesis of many organic compounds demand that the metallic impurity content be maintained at an absolute minimum.

Recently, in addition to quality and uniformity, the Chemical Industry has listed *availability* as another important factor. On all three of these points Dow Caustic Soda meets or exceeds requirements.

Dow is now producing the largest tonnage of Caustic Soda in its history. A substantial portion of this production is being shipped to the Chemical Industry from Dow plants. These plants, located in various strategic areas, mean exceptional *availability* of Dow Caustic Soda for *all* industry.

Dow Caustic Soda meets all high *quality* requirements. . . . Strict laboratory control assures consistent *uniformity*.

DOW

THE DOW CHEMICAL COMPANY, MIDLAND, MICHIGAN

New York • St. Louis • Chicago • San Francisco • Los Angeles • Seattle • Houston

Two Ways to Find SUBSTITUTES for *hard-to-get* materials?

1. If you plan to come to the National Chemical Exposition in Chicago, be sure to visit our booth. Here you will find complete information on replacements available in regular commercial quantities for such products as:

Glycerin	Dibutyl Phthalate
Beeswax	Carnauba Wax
Montan Wax	Aluminum Stearate (Technical)
Japan Wax	Olive Oil (Technical)
Ozokerite	Vegetable Gums (For thickening)

Industrial chemists from our laboratories will be in attendance to discuss your specific problems. Glyco Products have proven themselves a dependable source to scores of manufacturers and chemists who have been looking for substitutes for *hard-to-get* materials. Also on display at the booth will be Glyco's regular products: emulsifying agents, polyhydric alcohol esters, synthetic waxes, etc. . . . they have helped many people—maybe they can help you.

2. If you are unable to attend the show, write today for your free copy of our new catalog. It contains many formulae, new ideas, and complete information on a wide selection of synthetic materials. Our laboratories are always available to people who are looking for replacements of hard-to-get materials or who have specific problems in which Glyco Products may be of service. May we hear from you?

A few classifications of Glyco Products and some of the industries that use them:

Products

Polyhydric Alcohol Esters	Special Emulsions
Defoaming Agents	Synthetic Waxes
Deodorizers	Preservatives
Emulsifying Agents	Synthetic Resins
Plasticizers and Flexibilizers	Wetting and Foaming Agents

Industries

Abrasives	Oils
Adhesives	Paper
Cements	Pigments
Ceramics	Polishes
Coatings	Rubber
Leather	Textiles
Lubrication	Soaps and Cleaners

CHEMICALS BY GLYCO

GLYCO PRODUCTS CO., INC.

244 KING STREET BROOKLYN, N. Y.

UNCLE SAM'S SOLDIERS ARE DRESSED TO KILL

• America's soldiers like their lightweight, warm-weather uniforms. They like the smart, smooth surface of the cloth. The material is mercerized cotton. It *looks* good, it *feels* good, and it *wears* like iron.

• Michigan Alkali Caustic Soda plays an important part in mercerizing cotton—treating it with a solution of caustic alkali to toughen the fiber. This process also makes the material more receptive to dye, and imparts a silky luster.

• Michigan Alkali Caustic Soda has many uses for many industries. Most of them are now tied into the war effort. Other Michigan Alkali Products are busy at the day and night job of helping to make America an arsenal.

MICHIGAN ALKALI COMPANY

WYANDOTTE, MICHIGAN

NEW YORK • CHICAGO • CINCINNATI • ST. LOUIS • CHARLOTTE • DETROIT

DISTRIBUTORS IN ALL PRINCIPAL CITIES

SODA ASH • CAUSTIC SODA • CHLORINE • BICARBONATE OF SODA • CALCIUM CARBONATE • CALCIUM CHLORIDE • DRY ICE

A DEPENDABLE NAME FOR FINE CHEMICALS

APPEARING on the labels of more than 1,500 products used by customers in many fields—the name Merck is recognized as a dependable name for fine chemicals.

This high recognition is convincing proof of how well Merck & Co. Inc., manufacturer of fine chemicals for the professions and industry since 1818, has maintained the confidence of those whom it serves.

The Merck policies of scientific research, and rigid laboratory control of purity and uniformity . . . fortified by a rich tradition of experience and modern production facilities . . . ensure continued leadership in the present fields of chemistry, as well as in those still to be explored and conquered.

Our scientific staff and laboratories are prepared to serve you.

The illustrations below, made at the Merck plant in Rahway, N. J., are representative of the widespread activities of Merck & Co. Inc., in scientific research, modern production, and laboratory control of quality.

● **Pioneers in the Development of New Synthetic Chemicals.** Active in the manufacture of new synthetic chemicals ever since their therapeutic uses were demonstrated, Merck has played a prominent rôle in the development of this important line.

● **Original Large-Scale Producers of Many Fine Alkaloids.** The name Merck has been identified with the production of alkaloids and their salts for more than one hundred years.

● **Foremost in the Synthesis and Production of Pure Vitamins.** Discoveries and advances made in the vitamin field by Merck chemists and their collaborators, have continually emphasized the outstanding rôle played by Merck & Co. Inc. in the synthesis, development, and production of this therapeutically important line.

● **A Leader in the Production of Medicinal Chemicals.** Practically every chemical required by the physician or pharmaceutical manufacturer is available under the Merck label, and carries with it a guaranty of purity and reliability.

● **Manufacturers of Quinine Products since 1822.** Merck is headquarters for fine quinine products, the result of long experience and chemical skill.

MERCK & CO. Inc. *Manufacturing Chemists* **RAHWAY, N. J.**

New York, N. Y. • Philadelphia, Pa. • St. Louis, Mo. • Elkton, Va. • Chicago, Ill. • Los Angeles, Cal.

In Canada: **MERCK & CO. Limited, Montreal and Toronto**

USEFUL PQ SILICATES OF SODA

RESEARCH laboratories are joining the ranks of overtime workers; they're busy looking into the future for new products or new ways to make old ones.

To all who use silicates of soda or could use them, there is something useful for them in the PQ experience. In a period of over 75 years, we have stored up a lot of practical information on the properties and uses of soluble silicates.

Consult us if you have a problem which involves a soluble silicate. Our bulletins have been a real aid to many investigators. For a complete list of PQ Bulletins, ask for Bulletin 174, "Publications on Silicates of Soda and their Applications".

PHILADELPHIA QUARTZ CO.

Established 1831 General Offices and Laboratory: 125 S. Third Street, Philadelphia, Pa.
Chicago Sales Office: Engineering Bldg. Sold in Canada by National Silicates Ltd., Toronto, Ont.

THIS sentence, buried in a recent news story on the casualties at Pearl Harbor, is one of the most amazing statements in the history of medicine. It appeared—three quiet lines of type amid the screaming headlines of war—thirteen weeks after that fateful morning of December 7th.

It is important because it means that hundreds of American boys who were at Pearl Harbor are alive today, survivors of a type of wound that has been the dread of medical men for centuries.

It is the story of the life-saving sulfa drugs—their role in this war and the hope they hold for humanity.

Because these sulfa drugs are derivatives of coal-tar products and because the need for these drugs in every hospital and allied base is so urgently vital, Barrett is privileged to cooperate with the nation's great pharmaceutical houses to insure the production and delivery of *enough* of these products, *on time*.

If deliveries of Barrett Chemicals for civilian use are delayed or curtailed it is not only because they are essential for sulfa drugs . . . Barrett Chemicals for TNT and smokeless powder . . . for ship, tank and army truck finishes . . . for lubricating oils . . . for plastics . . . for extending rubber supplies . . . and for a host of other vital uses . . . are helping to speed America's weapons of war.

THE BARRETT DIVISION
ALLIED CHEMICAL & DYE CORPORATION
40 RECTOR STREET, NEW YORK

BARRETT COAL-TAR CHEMICALS: Tar Acids: Phenols, Cresols, Cresylic Acids Naphthalene Phthalic Anhydride *Cumar (Paracoumarone-Indene Resin) Rubber Compounding Materials Bardol* Barretan* Pickling Inhibitors Benzol Toluol Xylol Solvent Naphtha Hi-Flash Solvent Hydrogenated Coal-Tar Chemicals Flotation Agents Tar Distillates Anhydrous Ammonia Sulphate of Ammonia Arcadian* the *American* Nitrate of Soda

Barrett

ONE OF AMERICA'S GREAT BASIC BUSINESSES

*REG. U. S. PAT. OFF.

Someday You'll Want A Finer Metal Package

ALMOST before you are aware of it will come the transition back to normal, peaceful competition. Today, batteries of Heekin high speed lithograph presses are working on metal containers for packaging products needed by this nation for defense. If you have such a product, we can be of service to you. If you have not—remember Heekin Research Laboratories continue their efforts to improve lithography on metal. Someday you'll want a finer metal package . . . when that day comes remember us. In the meantime—Look Ahead.

THE HEEKIN CAN CO., CINCINNATI, OHIO

HEEKIN CANS

Lithographed

WITH HARMONIZED COLORS

Air Conditioning for a rivet

. . . and YOU!

Silly? To air condition rivets? Not at all. When aluminum rivets are cooled to sub-zero temperatures they can be riveted faster and more perfectly . . . *speeding up airplane production.*

Many of us think of air conditioning only in terms of comfort for human beings. Yet today, air conditioning's most important job is to keep the *machines* and *materials* of war industry at desired temperatures and humidities.

To meet these wartime needs, revolutionary advances in air conditioning technique have been made. Temperature and humidity are maintained *far more exactly* than ever before. Equipment is more compact, more flexible.

With the coming of peace, this experience will be applied to the making of improved air conditioning equipment for all sorts of uses.

Packaged air conditioners will be smaller, more compact, more economical—many more homes will have them. And in offices and factories, air conditioning will lower costs and increase efficiency. General Electric will be a logical source of all types of this new equipment for air conditioning, refrigeration, heat transfer and heating.

Air Conditioning and Commercial Refrigeration Department, Division 422, General Electric Company, Bloomfield, New Jersey.

Air Conditioning by

GENERAL ELECTRIC

Can You Use These New Chemicals?

Trichlorethane

$ClCH_2CHCl_2$

. . . is a colorless, volatile, non-flammable liquid soluble in most organic solvents, but difficultly soluble in water (0.48 per cent at 25°C.). It is stable under ordinary conditions of use, and is a good solvent and extractant for most oils, fats, and waxes, as well as natural and certain types of synthetic rubber. Its specific gravity at 20/20°C. is 1.4438; its boiling point at 760 mm. is 113.5°C.

Dichlorisopropyl Ether

$ClCH_2(CH_3)CHOCH(CH_3)CH_2Cl$

. . . is similar to dichlorethyl ether. It is miscible with almost all oils and organic liquids, and is an excellent solvent and extractant for fats, waxes, and greases. It should be useful in paint and varnish removers, spotting agents, and cleaning solutions, and as an intermediate in the manufacture of dyes, resins, and pharmaceuticals. It has value as a soap assistant in high temperature textile operations. Its properties include: boiling point, 187.3°C.; specific gravity at 20/20°C., 1.1122; solubility in water at 20°C., 0.17 per cent.

2-Ethylbutanol

$(C_2H_5)_2CHCH_2OH$

. . . is a colorless high-boiling (148.9°C.) solvent which is soluble in many organic substances. It is used in hydraulic fluids and synthetic resin varnishes. Its ester derivatives of dicarboxylic acids are plasticizers possessing low volatility and water solubility. 2-Ethylbutanol is effective in azeotropic distillation processes where the complete removal of water is desired. It is 0.43 per cent soluble in water at 20°C., while water is 4.56 per cent soluble in it.

Drum Lots Can Be Supplied Now

THESE synthetic organic chemicals . . . and a number of others we make . . . are available in drum quantities. Some are co-products of reactions used to make chemicals having high-priority uses. Supplies of others are on hand because customers' needs changed when they converted to war production. Since this supply situation changes rapidly, check with us when you need information about the availability of chemicals we make.

The new chemicals described here possess properties which may well result in profitable uses in your plant. Here is a non-flammable solvent . . . a high-boiling chlorinated ether . . . a component of hydraulic fluids which is also an excellent plasticizer intermediate. The applications given, however, are but suggestions of the wide range of possible uses for these versatile materials.

These interesting new chemicals are timely additions to the group of more than 160 synthetic organic chemicals produced commercially by Carbide and Carbon Chemicals Corporation, and, like the others, are products of the same, continuing research.

For information concerning the use of these chemicals, address:

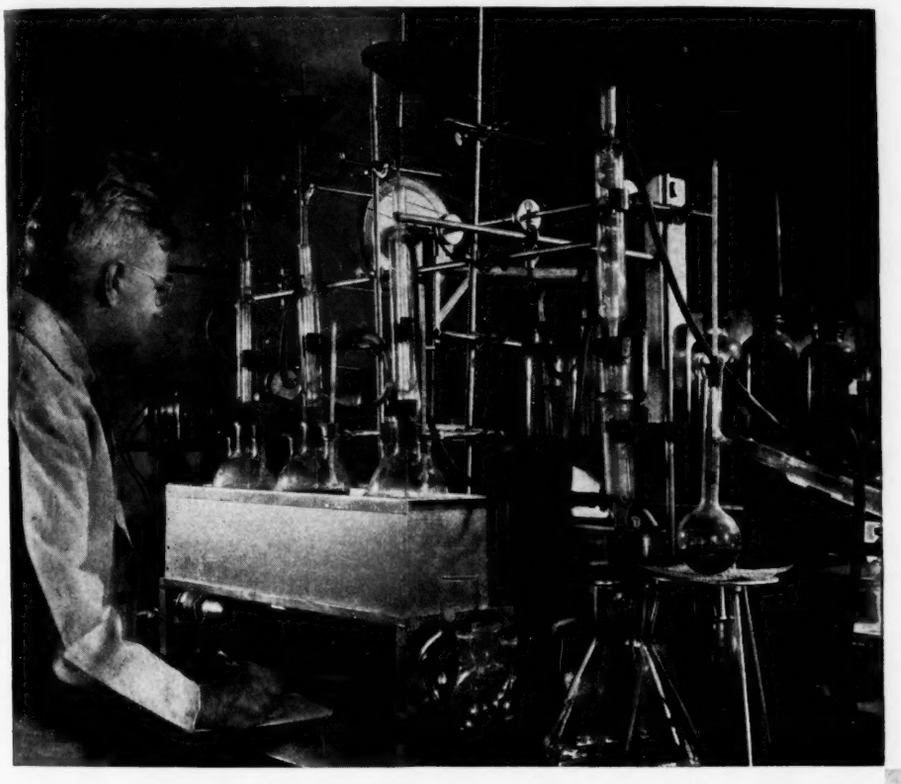
Carbide and Carbon Chemicals Corporation

Unit of Union Carbide and Carbon Corporation

30 East 42nd Street UCC **New York, N. Y.**

PRODUCERS OF SYNTHETIC ORGANIC CHEMICALS

CONTINUED RESEARCH



—for

still more tested linings for foods and chemicals is proceeding daily in our research laboratory

WILSON & BENNETT STEEL DRUMS and PAILS

THE range of products that can be packed in steel containers is constantly being broadened by the work our Research Laboratory is doing in developing new tested linings for drums and pails. Our regular customers can look forward to the use of Steri Seald lined containers for packaging a still greater range of products than ever before.

Military requirements for steel containers for the safe shipment of perishable and essential war materials to all parts of the world are now taking most available steel drums and pails. The protection provided by these Steel Containers against severe climatic conditions, rodents, vermin, and insect contamination, is eloquent evidence of their importance in maintaining freshness and purity of products.

WILSON & BENNETT
Steri Seald
LINED STEEL CONTAINER
JERSEY CITY • NEW ORLEANS
CHICAGO

WILSON & BENNETT MANUFACTURING CO.

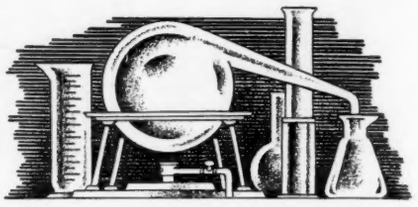
6532 SOUTH MENARD AVENUE, CHICAGO, ILLINOIS

Subsidiary of Inland Steel Company

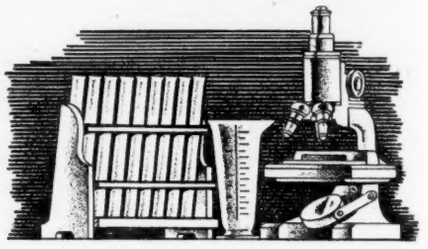
Plants at Chicago, Jersey City, New Orleans and Richmond, Cal. ● Sales offices in principal cities

Makers of Steel Drums and Pails

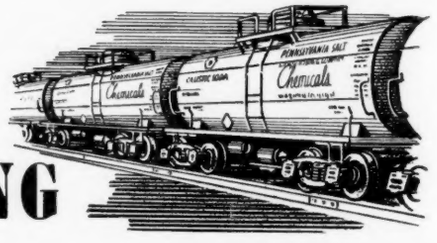
PURITY TO PROTECT YOUR PROCESSES



UNIFORMITY TO SPEED PRODUCTION



SPECIAL TANK CARS FOR EFFICIENT HANDLING



CAUSTIC SODA

made by Penn Salt

Penn Salt Caustic Soda will meet your most exacting requirements for quality and uniformity. A double purification process makes it low in salt content, low in carbonates, and extremely low in iron.

The Penn Salt tank cars for liquid Caustic Soda cut handling costs by making unloading easier, safer and more complete. Each is equipped with a protective lining, special draining plates and simple, easily accessible fittings. A dome safety platform and guard railing protect your workmen.

This clean Penn Salt caustic can be supplied as 50% and 72-73% solutions in 8000-gallon tank cars; as a solid in 750 lb. drums; or in flake form in 400 and 100 lb. drums. Our technical staff is at your service to help with problems of handling.

Write for complete information.

REG. U.S. PAT. OFF.

PENNSYLVANIA SALT
MANUFACTURING COMPANY
Chemicals
1000 WIDENER BUILDING, PHILADELPHIA, PA.
New York • Chicago • St. Louis • Pittsburgh • Wyandotte • Tacoma

WAR NEEDS FOR STEEL
RESTRICT USE OF STEEL DRUMS*

*(W. P. B. Order L-197)

We may be able to help you meet this packaging problem

So, First Look to St. Regis Multiwall Paper Bags to Replace Steel Drums.

Because many chemical plants have found St. Regis multiwall paper bags highly satisfactory as containers for their products we believe we can help you solve a critical packaging problem, *right now*, if this curtailment of steel drums affects your operations.

St. Regis maintains a staff of trained packaging engineers in all sections of the country. These men are equipped by knowledge and experience to study your product, recommend type of bag to fit into your plant operation and construction of bag to protect your product. Our bag plants are located in all strategic industrial areas, and quick deliveries can be made.

Call St. Regis—our response will be prompt

MULTIWALL
St. Regis PAPER BAGS
MULTIPLY PROTECTION • MULTIPLY SALEABILITY

ST. REGIS PAPER COMPANY

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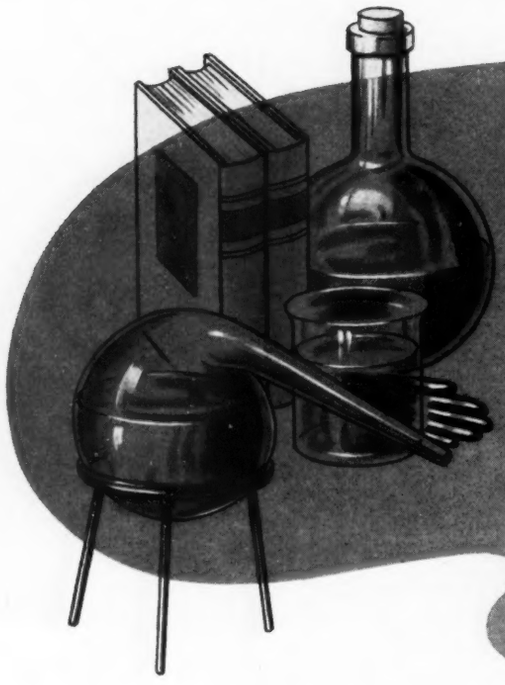


NEW *Du Pont* RESEARCH CHEMICALS

These chemicals, developed by du Pont research, offer interesting possibilities for the production of new and essential materials.

SODIUM METHYL SULFATE ($NaCH_3SO_4$)

is a methylating agent. It should be of particular interest in methylating operations where convenient physical form, high solubility and lack of volatility are desirable. This product is available in sample quantities as a 50% aqueous solution. ***Available in small quantities for experimental investigation only.***

SODIUM CHLOROSULFONATE ($NaClSO_3$)

is a finely divided crystalline powder which hydrolyzes rapidly to liberate hydrochloric acid. With the application of heat, the dry salt decomposes to yield chlorine and sulfur dioxide. It has possible use in the manufacture of materials in which sulfonation and chlorination reactions would be involved. The chlorosulfonates of calcium, magnesium, aluminum, iron, copper and lead can also be made available in sample quantities in case of special interest. ***Available in small quantities for experimental investigation only.***

GLYOXAL SULFATE ($SO_4CH\text{-}CHSO_4$)

is a white crystalline powder soluble in the lower alcohols and ketones. It is also markedly soluble in water at somewhat elevated temperatures (about 50°C.) although slow decomposition takes place under these conditions. This material is of interest as a possible source of monomeric glyoxal, the simplest dialdehyde, which may be useful in reactions involving insolubilization and cross-linking. ***Available in small quantities for experimental investigation only.***

SULFUR PENTOXYDICHLORIDE ($Cl\text{-}SO_2\text{-}O\text{-}SO_2\text{-}Cl$)

is a straw-colored liquid boiling at 150°C. It is only slowly soluble in cold water but reacts violently with water on warming. It is miscible with a variety of organic liquids and readily reacts with the ethylene linkages, hydroxyl groups and amine groups. Of interest is its possible use in the solubilization of petroleum, vegetable and fish oils. ***Available in small quantities for experimental investigation only.***

ACID HYDROXYACETIC 70% Technical Grade ($HOCH_2COOH$)

A synthetic organic acid (Glycollic Acid) derived from coal, air, and water by high pressure synthesis. Contains 30% water, plus a small quantity of impurities. Strength approximates that of lactic and formic acids. Non-volatile and readily soluble in water. Bifunctional, it exhibits the properties of both acids and alcohols. Uses: tanning of leather, dyeing of leather and textiles, metal treatment, acid dairy detergency, rubber coagulation, and organic synthesis. ***Available in commercial quantities.***

ACID HYDROXYACETIC (Acid Glycollic) ($HOCH_2COOH$)

An organic acid derived from coal, air, and water by high pressure synthesis. Strength approximates that of lactic and formic acids. Non-toxic, non-volatile, readily soluble in water. Bifunctional, it exhibits the properties of both acids and alcohols. Suggested uses: acidification of foodstuffs, beverages, pharmaceuticals, cosmetics, and photographic chemicals. ***Available in small quantities for experimental investigation only.***

DU PONT REG. U. S. PAT. OFF.

BETTER THINGS FOR BETTER

SODIUM PERBORATE MONOHYDRATE ($NaBO_3 \cdot H_2O$)

Active oxygen 15%, stable at ordinary temperatures, compatible with a wide range of materials for pharmaceutical compounding, and possessing a higher active oxygen content than sodium perborate tetrahydrate. Slight hygroscopic tendency. ***Available in limited commercial quantities.***

ZINC PEROXIDE Medicinal Grade (ZnO_2)

Active oxygen 8.5%. A specialty preparation having a pH in water suspension substantially the same as that for body fluids, plus the characteristic of slowly releasing its active oxygen over a period of time in contact with body tissue. Applications of value in the medical, dental, and veterinary fields. ***Available in limited commercial quantities.***

SODIUM PERCARBONATE ($2Na_2CO_3 \cdot 3H_2O_2$)

Active oxygen 15%, molecular weight, 314. Water solubility 25-30 grams per 100 cc. at 30°C. Dissolves with negative heat of solution. pH of water solution 10-10.2. Good stability at room temperatures up to 110°C., and in high humidity. Suggested uses: Pharmaceutical, food industry, specialized industrial applications. ***Available only in small quantities for experimental investigation.***

POLYVINYL ALCOHOL ($(CH_2{=}CHOH)_x$)

a white to cream solid powder soluble in water, insoluble in common organic solvents. Uses: adhesive, emulsifying agent, size for textiles, paper, leather, fabrics where grease and oil resistance is desired. Transparent, grease-proof films made from water solutions. Plasticized solid molded to grease and solvent-proof articles with rubber-like properties. ***Commercially available in low, medium and high viscosity grades.***

POLYVINYL ACETATE ($(CH_2CHOOCCH_3)_x$)

transparent, thermoplastic solid is soluble in esters, ketones, alcohols, acids, chlorinated and aromatic hydrocarbons; insoluble in water, mineral and vegetable oils and fats, glycerin; water emulsions are stable. May be hydrolyzed to polyvinyl alcohol. Uses: Heat-sealing and solvent-activated adhesives, latex extender and substitute, binder for paper pulp and scrap leather, ingredient in textile sizing and finishing compositions and in compositions for molding rubber-like articles. ***Commercially available in bead, solution and emulsion forms.***

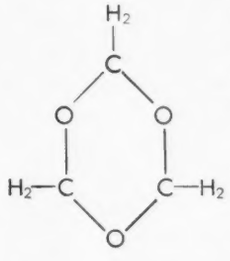
POTASSIUM CYANIDE (KCN)

Domestic

White granular product of high purity (96%) and uniformity. Uses: In silver plating, makes possible dense, smooth deposits; heavy fine-grained adherent coatings at high current densities; other material operating advantages. Also useful in gold and copper plating; heat treatment of steel (nitriding); chemical reagent. Made in the U.S.A. ***Available in commercial quantities.***

TRIOXANE

White crystalline material, melting at 63—64°C., is a unique form of anhydrous formaldehyde. Its high degrees of compatibility with organic materials and the ease with which its reactions may be controlled should make it particularly attractive for use in organic synthesis. In these respects it differs considerably from known commercial forms of formaldehyde. It is also unique in that it possesses no formaldehyde odor when pure and is relatively inert in the absence of strongly acidic catalysts. It is converted to reactive monomeric formaldehyde by traces of acidic catalysts such as mineral acids, zinc chloride, ferric chloride, etc. In the presence of these materials, trioxane reacts as formaldehyde with many organic compounds at a rate determined by the catalyst concentration and the temperature of the reaction media. In its molten form it is also an excellent solvent alone or in combination with water, alcohol and other organic solvents. ***Available in small quantities for experimental investigation.***

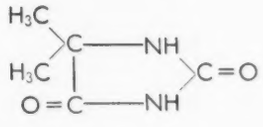


VINYL CYANIDE (Acrylonitrile) ($CH_2{=}CH-CN$)

is a stable, colorless, mobile liquid, moderately soluble in water but completely soluble in alcohols, ether, acetone and other common organic solvents. Its extreme reactivity makes it a valuable intermediate for organic syntheses. The presence of the double bond, together with a reactive nitrile group permits typical reactions such as hydrolysis and esterification as well as a wide range of ethylenic additions with other materials. It can be made to polymerize by itself or with other polymerizable materials. Some of the resulting copolymers have found applications in the synthetic rubber field. ***Under W.P.B. allocation, GPO M-153.***

DIMETHYL HYDANTOIN

is a white, odorless solid (M.P. 178°C.) which crystallizes in the form of prisms or needles from water, alcohol or diethyl ether. Deposits as needles when sublimed.



It is readily soluble in water, alcohol, diethyl ether and ethyl acetate. Uses: Resins and plasticizer intermediate; modifier for other water-soluble materials. ***Available in small quantities for experimental investigation.***

Although many of these new chemicals are available only in limited quantities at this time, special consideration will be given to the commercial production of any of these products which may have immediate use in war production. For available technical information write to E. I. Du Pont de Nemours & Co. (Inc.), Wilmington, Delaware.

LIVING... THROUGH CHEMISTRY

DU PONT
REG. U.S. PAT. OFF.

COLUMBIA CHEMICALS

. . . . EVEN IN THE DEFENSES OF THE *Sky*

In the fabrication and flying of barrage balloons as well as in the making and operation of a wide range of other war weapons for land, sea and sky, COLUMBIA CHEMICALS play a vital role. They assist in speeding production, improving the quality. And they contribute importantly to the attainment of new and better standards of performance. Thus, today, you'll find COLUMBIA CHEMICALS being relied upon as essential aids in the manufacture of rubber, steel, munitions, chemicals, textiles, soap, paper, foods, drugs . . . practically everything our armed forces use or wear. That's why, if you, right now, have a need for basic chemicals, a need that is vital to victory, you will find it advantageous to call upon COLUMBIA. Here, as always, deliveries are as prompt as the most efficient use of current transportation facilities will permit.

ESSENTIAL INDUSTRIAL CHEMICALS

SODA ASH • CAUSTIC SODA • SODIUM BICARBONATE • LIQUID CHLORINE • SILENE* CALCIUM CHLORIDE • SODA BRIQUETTES MODIFIED SODAS • CAUSTIC ASH • PHOSFLAKE CALCENE** • CALCIUM HYPOCHLORITE

*Precipitated Calcium Silicate **Precipitated Calcium Carbonate

COLUMBIA CHEMICALS

PITTSBURGH PLATE GLASS COMPANY
COLUMBIA CHEMICAL DIVISION
GRANT BUILDING, PITTSBURGH, PA.

CHICAGO • BOSTON • ST. LOUIS • NEW YORK • CINCINNATI
CLEVELAND • MINNEAPOLIS • PHILADELPHIA • CHARLOTTE

2-CYCLE DOUBLES NUMBER OF POWER STROKES

Every Down Stroke a Power Stroke

The 2-cycle engine was developed to eliminate what was known as the "waste" stroke in 4-cycle operation. In the 2-cycle engine, instead of only half of the piston's down-strokes being power strokes, every down-stroke is a power stroke!

In the perfected CLARK Super-2-Cycle Engine this has resulted in power output also being actually doubled, as compared with the 4-cycle engine of equivalent size and displacement.

In addition to doubled power, the 2-cycle principle as perfected in CLARK "Angle" Compressors, offers these basic advantages:

1. GREATER SIMPLICITY — No intake or exhaust valves.
2. GREATER FUEL ECONOMY—due to Clark patented Fuel Injection.
3. LESS WEAR—as the power is produced with half the number of power cylinders.
4. SMOOTHER OPERATION.
5. FEWER MAN HOURS — due to simple design, few parts, and ease of servicing vertical cylinders.
6. LOWER OIL CONSUMPTION.
7. LOWER INSTALLATION COST—due to shipment assembled, small foundations, small buildings.

These points, explaining the leadership of the CLARK "Angle", merit your thorough investigation. Our engineers are at your service.

CLARK BROS. CO., INC. . . . . OLEAN, NEW YORK, U. S. A.

Export Offices: 30 Rockefeller Plaza, New York. Domestic Sales Offices and Warehouses: Tulsa, Okla.; Houston, Texas; Chicago, Ill. (122 S. Michigan Ave.); Boston, Mass. (131 Clarendon St.); Huntington Park, Calif. (5715 Bicket St.) Foreign Offices: 72 Turnmill St., E. C. 1, London; Avda Roque Saenz Pena 832, Buenos Aires.

Affiliated Companies: Dresser Mfg. Co., Bradford Pa.; Pacific Pump Works, Huntington Park, Calif.; Bryant Heater Co., Cleveland, Ohio.

CLARK 6-Cylinder 600 H.P. "Super-2-Cycle" Angle Compressor

CLARK

Super-2-Cycle

IF YOU NEED PIPING IN A HURRY try GLASS

IF YOUR plans call for a new pipe line or one of your present pipe lines needs replacing, here is a piping that you can obtain in a hurry. Available in sizes of 1″, 1½″, 2″, 3″ and 4″, for pressures up to 100 lbs. per square inch, PYREX Piping for years has been giving trouble-free, economical service throughout industry.

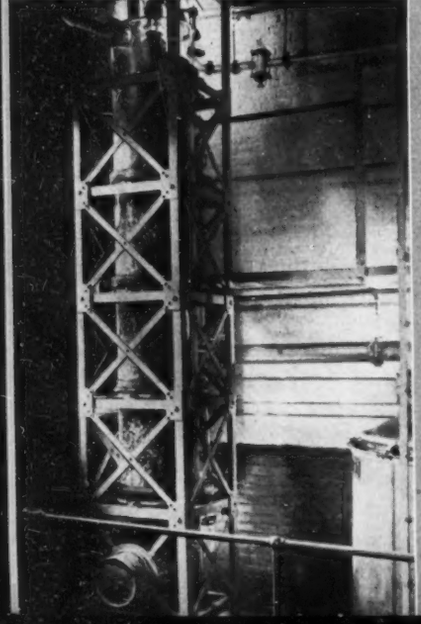
Long life and low-cost performance records are not surprising when you consider that PYREX brand Glass:

1. Has remarkable resistance to *all* acids (except concentrated HF).
2. Resists thermal shock that would instantly shatter ordinary glass.
3. Reduces pitting and scaling; often prevents these entirely.
4. Permits constant visual inspection of both pipe line and its contents.
5. Withstands powerful destructive combinations of abrasive slurries and strong, hot acids.

OLD AND NEW USERS SAY GLASS PIPING IS EASY TO INSTALL AND MAINTAIN.

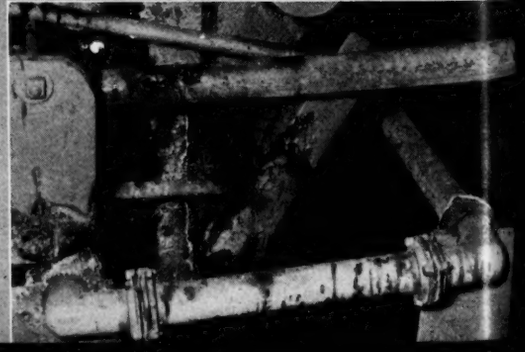
The entire experience of Corning engineers is available to assist in adapting PYREX Piping to your particular problems. Write to Industrial Division, Corning Glass Works, Corning, N. Y. Branch Offices, New York, 718 Fifth Avenue; Chicago, Merchandise Mart.

New York Quinine & Chemical Works equipment for producing pure Nitric Acid; absorption column, pump, valves and piping all PYREX brand Glass.

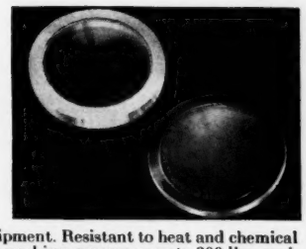


PYREX Piping used as lines for brine feed, cell over-flow and chlorine gas in West Virginia Pulp & Paper Co. plant.

A PYREX Pipe line after 8 years of continuous torture carrying a slurry of crushed quartz and sulphuric acid.

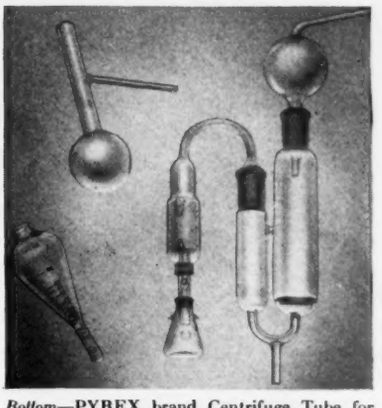


A FEW OF THE MANY OTHER PYREX BRAND GLASS PRODUCTS

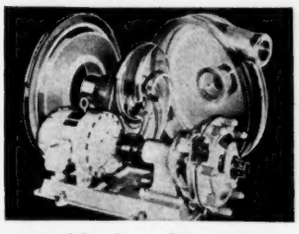


PYREX Sight Glasses for sight ports or openings in chemical tanks, storage tanks, stills, absorption columns, ovens, evaporators, oil furnaces, reaction kettles, digestors, dryers, pipe lines, and other storage or processing equipment. Resistant to heat and chemical action. Available for working pressures up to 300 lbs. p.s.i.

MACBETH Brand Flat Gauge Glasses, reflex and plain, for service where steam pressures exceed 500 pounds per square inch.



Bottom—PYREX brand Centrifuge Tube for determination of water and sediment in petroleum products. *Top*—VYCOR Brand Engler Distilling Flask for standard test in distillation of gasoline, naphtha, kerosene, etc. *Right*—PYREX brand apparatus for determination by lamp method of sulphur in illuminating oils and other petroleum products.



NASH Centrifugal Pump with PYREX brand glass parts that are resistant to chemical attack and thermal shock. Widely used—particularly with PYREX Piping—where solutions to be conveyed involve problems of corrosion-attack or product purity.

Left—Precisely made Bubble Caps for a fractionating column. *Right*—One of several types of spray nozzles made from PYREX Industrial Glass.

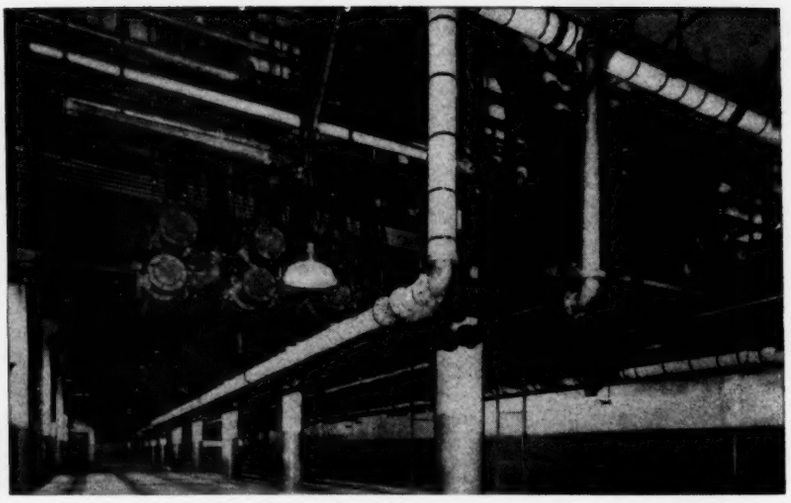
CORNING
Glass Works
Corning, New York

Pyrex Industrial Glass
BRAND

Blackstone Valley Gas & Electric Co. cascade cooler—a double bank of 36 PYREX glass tubes 19' long is under a constant deluge of corrosive sea water winter and summer to cool hot ammoniacal liquor.

Visit our
BOOTH No. 169
at the Chicago
1942 NATIONAL CHEMICAL EXPOSITION
SHERMAN HOTEL — NOVEMBER 24-29

Ace rubber lined Stacks and Flue Ducts together with Ace rubber covered and lined blowers for carrying off acid fumes.



Ace hard rubber pipe in sizes from 1½ to 8 inches in the above installation. New technique of installation has removed many of previous limitations of hard rubber pipe and fittings.

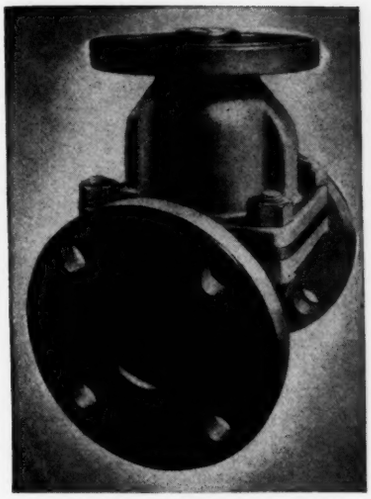
Back

- Ace is Hard Rubber headquarters for rugged and precision parts . . . some smaller than a dime . . some large as a desk . . . . . all with these advantages:

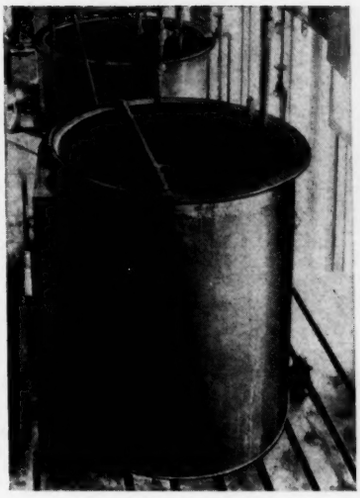
Dependable and Economical
Alkali and Acid resistant • Highest electrical and radio insulation properties • Non-Hygroscopic
Easily machined, turned, finished.

Ace hard rubber Flexible Pail. 3 gallon size. Will not chip, crack or give trouble in normal service.

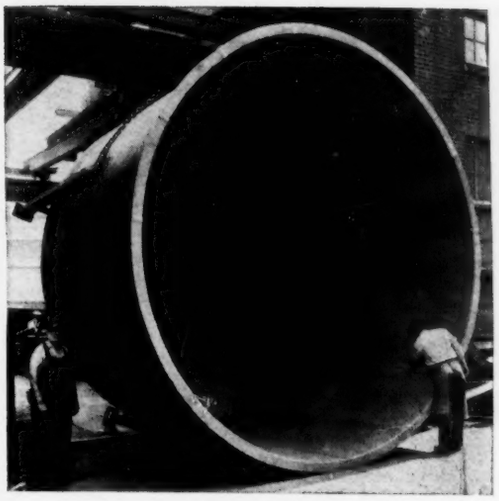
ACE



Ace hard or soft rubber lined diaphragm valve. Sizes from 1 to 12 inches.



Ace rubber lined bleach and caustic solution tanks.



Ace rubber lined storage tanks made in all sizes for safe storage of expensive chemicals.

of the lines... ACE prevents corrosion

★ Tanks, tank cars, pipe lines, valves, pumps, pipe fittings, ACE rubber lined—or lined and covered—offer

. . . . . positive protection against corrosion and contamination
. . . . . rubber compounded to meet specific requirements
. . . . . wide temperature range
. . . . . smooth, non-porous surfaces—easily cleaned

★ "Back of the lines"—SAFE with ACE.

AMERICAN HARD RUBBER COMPANY • 11 MERCER STREET, NEW YORK, N. Y.
AKRON, OHIO 111 WEST WASHINGTON STREET, CHICAGO, ILL.

RUBBER PROTECTION
for Defense against Corrosion

Chemicals FOR TANNING

Acids • Aluminum Sulphate • Copperas
Borax • Carbon Tetrachloride • Caustic Soda
Tartar Emetic • Sulphur

Despite the present importance of mechanized equipment, our Armed Forces still travel on leather. To meet this herculean task of supplying Army, Navy and Marine Corps requirements plus civilian needs, the leather industry is using much larger quantities of chemicals, for which Stauffer has the facilities to meet these increased demands.

ALSO MANUFACTURERS OF

Boric Acid
Citric Acid
*Commercial Muriatic Acid
*Commercial Nitric Acid
Cream of Tartar
Liquid Chlorine
*Nitrate of Potash
Silicon Tetrachloride
Sodium Hydrosulphide
Sulphuric Acid
Sulphur Chloride
*Superphosphate
Titanium Tetrachloride

*Items marked with star are sold on West Coast only.

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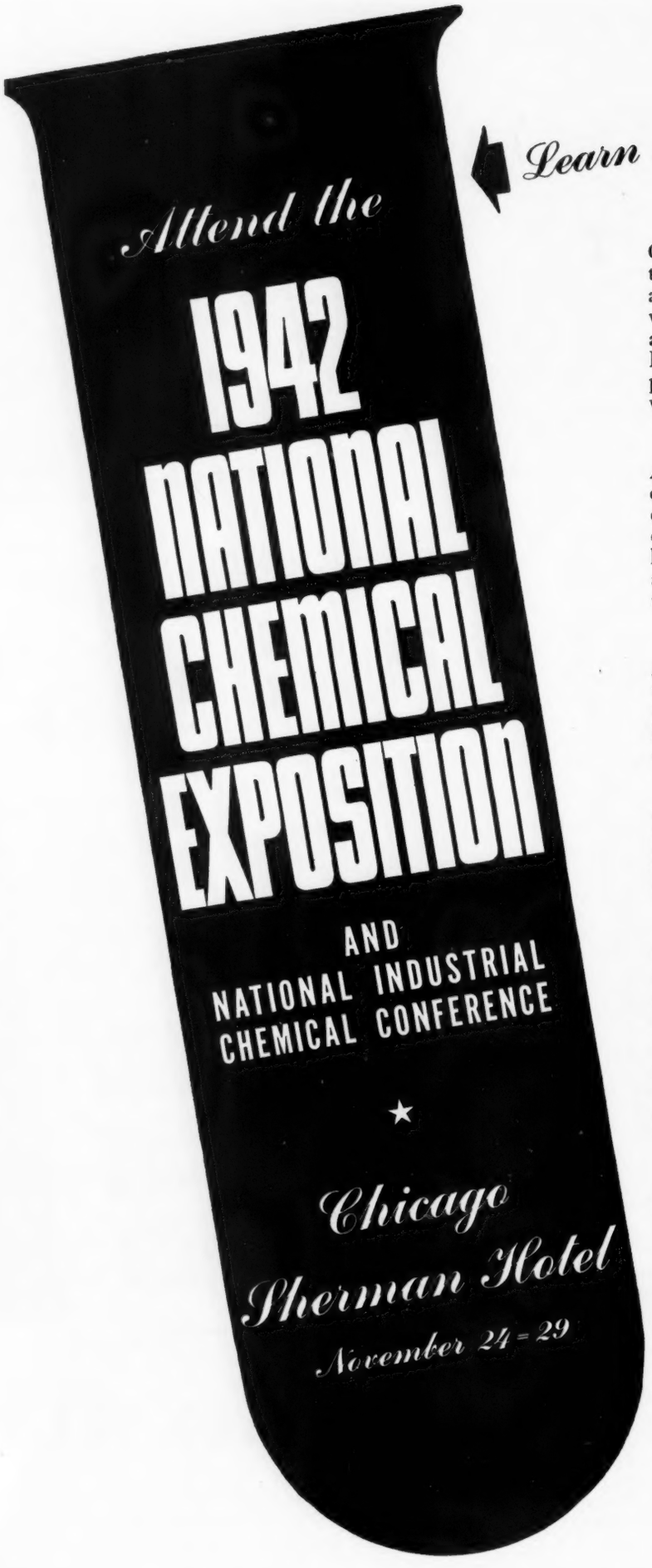
NORTH PORTLAND, OREGON
FREEPORT, TEXAS APOPKA, FLORIDA



Learn new uses of alternates

Chemistry has gone to war! Research directors, chemists, plant managers, engineers and executives who attend the Exposition, will find a vast store of knowledge available concerning new methods and materials. Men high in their respective fields will impart interesting data vital to both America's war effort and to civilian economy.

INDUSTRIAL MOVIES

A continuous showing will provide a liberal education in chemical processing. Subjects covered will include plastics, rayon, chemical stoneware, glass, bread, coke, white lead, glass insulators, gelatin capsules, steel, aluminum and many others important to the American way of life.

COMMERCIAL EXHIBITS

An imposing list of leaders in every field will display and introduce many new items to the profession. These remarkable exhibits, in themselves, will completely justify attendance.

SCIENTIFIC EXHIBIT

The "Electronic Microscope" will be exhibited by RCA Manufacturing Company. See actual micrographs from this Electronic Microscope.

SPECIAL EXHIBITS

The War Production Board (W.P.B.) exhibit demonstrates reclamation and recovery of vital chemical products.

"Successful alternates and substitutes"—the extensive exhibit prepared by Dr. Harrison E. Howe.

"New Chemicals"—a significant exhibit by W. J. Murphy.

For details concerning available exhibit space, consult

MARCUS W. HINSON, Exposition Manager
110 N. Franklin Street, Chicago, Ill.
Phone Franklin 2245

★ *Buy more United*

and substitutes

PROGRAM *National Industrial Chemical Conference*

Wednesday Afternoon, November 25, 1942, 2:00-4:00 pm

"Plastics and Paper"
Presiding, NORMAN L. SHEPARD
Chemical Director
American Cyanamid Company
New York, New York

"Raw Material Supplies for Plastics Manufacture"
By ARTHUR E. PETERSEN
Chief of Organic Plastics and Resins Section, Materials Division, Chemical Branch, War Production Board, Washington, D. C.

"Paper and Paper Materials"
By ALLEN ABRAMS
Vice-President in Charge of Research and Development, Marathon Paper Mills Company, Rothschild, Wisconsin

Thursday Evening, November 26, 1942, 6:30 pm

Joint meeting of the National Industrial Chemical Conference and the Chicago Section of the American Chemical Society.

Presiding, R. C. NEWTON
Vice-President, Swift & Company, Chicago, Illinois

"The Electron Microscope in Relation to Chemical Research"
By V. K. ZWORYKIN, Associate Director, Research Laboratories, RCA Manufacturing Company, Camden, New Jersey

Friday Afternoon, November 27, 1942, 2:00-5:00 pm

"Food and the Relation of Food to the Chemistry of Plants and the Soil"
Presiding, C. G. KING, Scientific Director
The Nutrition Foundation, Inc., New York, New York

"Soil Fertility and the Human Species"
By W. A. ALBRECHT
Chairman Department of Soils, College of Agriculture
Columbia, Missouri

"The Soil and Crop Basis of Better Nutrition"
By L. A. MAYNARD, Director
School of Nutrition and the United States Plant Soil and Nutrition Laboratory, Cornell University, Ithaca, New York

"Food and Nutrition as Related to War"
By C. G. KING
Scientific Director, The Nutrition Foundation, Inc.
New York, New York

Friday Evening, November 27, 1942, 8:00-9:15 pm

Presiding, VICTOR CONQUEST
Director of Research, Armour & Company
Chicago, Illinois

"The Cyclotron and its Uses in Research"
By P. GERALD KRUGER, Department of Physics
University of Illinois, Urbana, Illinois

Saturday Afternoon, November 28, 1942, 1:45-5:00 pm

"A Symposium on Industrial War Problems"
Presiding, C. S. MINER, Director, Miner Laboratories
Chicago, Illinois

"Waste Treatment in Industry as Related to War Economy"
By F. W. MOHLMAN
Director of Laboratories, Sanitary District of Chicago
Chicago, Illinois

"Control of War Time Incendiaries"
By WARD V. EVANS, Professor of Chemistry
Northwestern University, Evanston, Illinois

"The Salvage and Conservation of Chemicals in Industry"
By S. DONALD PERLMAN, Executive Chemical Director
Industrial Salvage Section, Conservation Division
War Production Board

States War Savings Bonds

All-Out War and Chemical Research

EDITORIAL

Walter J. Murphy, Editor

One of the country's foremost science editors whose column is read daily by millions recently made the statement that the conflagration of 1914-1919 was a struggle between the best chemical brains of Germany and the Allies, while the present holocaust is a battle of wits between the physicists of the United Nations and the Axis. To a certain degree this is true, but largely it is at best but a half-truth.

Dr. Charles M. A. Stine supplied the correct answer to this remark in his address before the 104th Meeting of the American Chemical Society in Buffalo last month when he said:

"I am not implying that all research is chemical or that chemistry provides the one Aladdin's lamp which all scientists must rub. However, let chemistry be ignored and the other lamps become lifeless brass. Perhaps the greatest benefit that has come to America from our chemical awakening is the renascence of all science that has accompanied it. The chemical synthesis of vitamins, for example, to say nothing of hormones and the sulfa drugs, not only is revolutionizing medicine and dietetics but putting these sciences on incomparably higher planes of performance and future promise. And at the opposite extreme of the pendulum's swing, the modern long-range bomber, while a machine, is also a composite chemical triumph expressed in metals, plastics and liquids."

The spectacular achievements of our chemists during World War I were very necessarily basic in character and brought us domestic sources of what may loosely be called chemical raw materials. Utilizing these together with a super-abundance of natural raw materials our chemists have moved in, so to speak, on industries that even today the layman fails to think of as being affected by chemistry. Chemists have revolutionized manufacturing operations and, indeed, have in thousands of instances completely changed the end or finished product. The general public, despite all the information and mis-information that it has been deluged with concerning the rubber situation, is thinking largely in terms of tires and inner tubes and certainly not in the terms of organic chemistry. This is easily understandable for the complexity of the reactions involved in producing synthetic rubber is such that the man or woman with but a meager high school chemistry course as a background cannot hope to comprehend the jargon of organic chemists. The man on the street thinks of magnesium and aluminum solely as metals—not as chemicals, and does not appreciate the important part the chemist plays in making these metals available in large quantities.

World War II has been aptly described as a "Global War" and rightfully so. But the fighting of such a war is possible only because of advances in the science of communications and especially in aviation. Yet it is largely as a result of chemical advances in fuels, plastics and light metals that aircraft engineers have been able to design planes capable of the miracles of present-day performance. Some two hundred or more chemicals are employed in the production of the modern plane and about the same number in the manufacture of a tank.

Unquestionably the biggest contribution chemists and chemical engineers are supplying today is increasing at almost fantastic rates the output of well-known basic chemicals. Short-cuts in manufacturing technique, about which little or nothing can be published for the duration, are supplying America's war program with many of the vital tools to defeat the Axis. In addition, however, the chemical brains working in hundreds of research laboratories are bringing forth many new chemicals. Certain of these are military secrets and as such cannot be included in the 1942 Edition of "New Chemicals for Industry" to be displayed at the coming National Chemical Exposition to be held in Chicago next month. Yet with over three hundred chemicals developed in the past two years ready for display it can hardly be said that any moratorium on research exists in the laboratories of the country. Such a foresighted policy on the part of management is a guarantee that not only will we win the war but the peace that follows as well.

The editors of "Chemical Industries" extend a cordial welcome to those attending the Exposition to inspect the exhibit "New Chemicals for Industry." This physical display of the fruits of American chemical research has earned the plaudits of thousands who have viewed it at previous expositions in New York and Chicago. For those who cannot attend the Chicago Exposition we publish in this issue a complete checklist of the products. It is the patriotic as well as the sensible duty of every chemist to study these descriptions with minute care. The answers to many bottlenecks of production are contained in these pages.

Chemists in the Role of War Observers: Novel, indeed, is the suggestion made by Otto Eisenschiml in his paper entitled "The Chemist in Three Wars," delivered before the newly formed Chicago Chapter of the American Institute of Chemists, that we should have competent chemical observers at our various fronts. "We have press correspondents." said the speaker, "Why not chemical scouts."

This is a fair and intelligent question to ask our high army and navy officials and yet we suspect, indeed, the editors of CHEMICAL INDUSTRIES have good reason to believe that this practical suggestion has been turned down.

It is true that we have a Chemical Warfare Branch of the army and it is truly doing a magnificent job. But fundamentally that job is not the one that Mr. Eisenschiml is thinking of.

Fortunately for the Allied cause in the last war a chemist was present in the front line Canadian trenches when the Germans let loose the first poison gas attack. He immediately recognized the gas to be chlorine and through his knowledge of chemistry was able to suggest a very effective albeit disgusting method of protection for thousands of soldiers under attack. It would have been just too bad for the Allied nations on that particular day of surprise attack if the whole matter had simply been referred back for solution to a group of "brass hats" several hundred miles to the rear. It was gas in the last war that nearly robbed us of victory. Perhaps it may be something else that will come like a thunderbolt in World War II.

It is Mr. Eisenschiml's contention that we should have highly-trained mature chemists with broad experience at every theatre of war to act in an advisory capacity on all matters chemical in nature—not only those dealing with gas warfare, but also those dealing with ordnance, food, health, etc. He contends that such highly trained technologists may advise preventive rather than remedial steps. This provocative suggestion is worth further consideration.

Scrap Is Essential To Victory: Salvage programs in our cities and towns are bringing in thousands of tons of scrap iron and steel but industrial salvage and conservation must form the backbone of the War Production Board's campaign to put the nation's waste back into production channels. Unless American industries take on the major job of making broken down, dismantled or unusable materials available for scrap, the national supply of steel for manufacture of war equipment will be seriously endangered. The chemical industry has a particular interest in seeing that scrap reaches the steel industry in large quantities for upon adequate supplies of steel depends much of the success of not only the synthetic rubber program but a great deal of the tremendous expansion program now going on in manufacturing facilities in several important industrial chemicals.

As its contribution in the all-important salvage program this publication presents in this issue the detailed plan now in operation in the plants of Monsanto Chemical Co. The attention of management in the chemical field is called not only to this article but also to the following ten suggestions for getting out industrial scrap:—

1. Head up the campaign by appointing an able executive of the company, armed with authority to act.
2. Use posters, illustrations, pay-envelope stuffers, and all other publicity means to enlist all employees in scrap campaign.
3. Comb plant and yards for dormant scrap and unusable and abandoned equipment.
4. Survey all plant equipment, particularly idle, standing or discarded machines.
5. Classify and segregate scrap and supervise its handling.
6. Make each foreman responsible for preventing spoilage and waste in his department.
7. Report promptly equipment which is obsolete. If equipment has not been used in three months, and it can't be proved that it will be used in the next three, turn it over where it can be used—or scrap it.
8. Salvage usable parts from equipment marked for scrapping.
9. Speed return of scrap to mills and refineries through existing channels. Report regularly on collections of scrap to the Industrial Salvage Committee set up by the War Production Board in your community.
10. Enforce monthly re-checks in every department to find scrap material previously overlooked.

More than 3,000 trained field men, loaned by private industry to assist in the industrial salvage program are augmenting the manpower of W P B's Conservation Division. Cooperate with these men —seek out their assistance NOW.

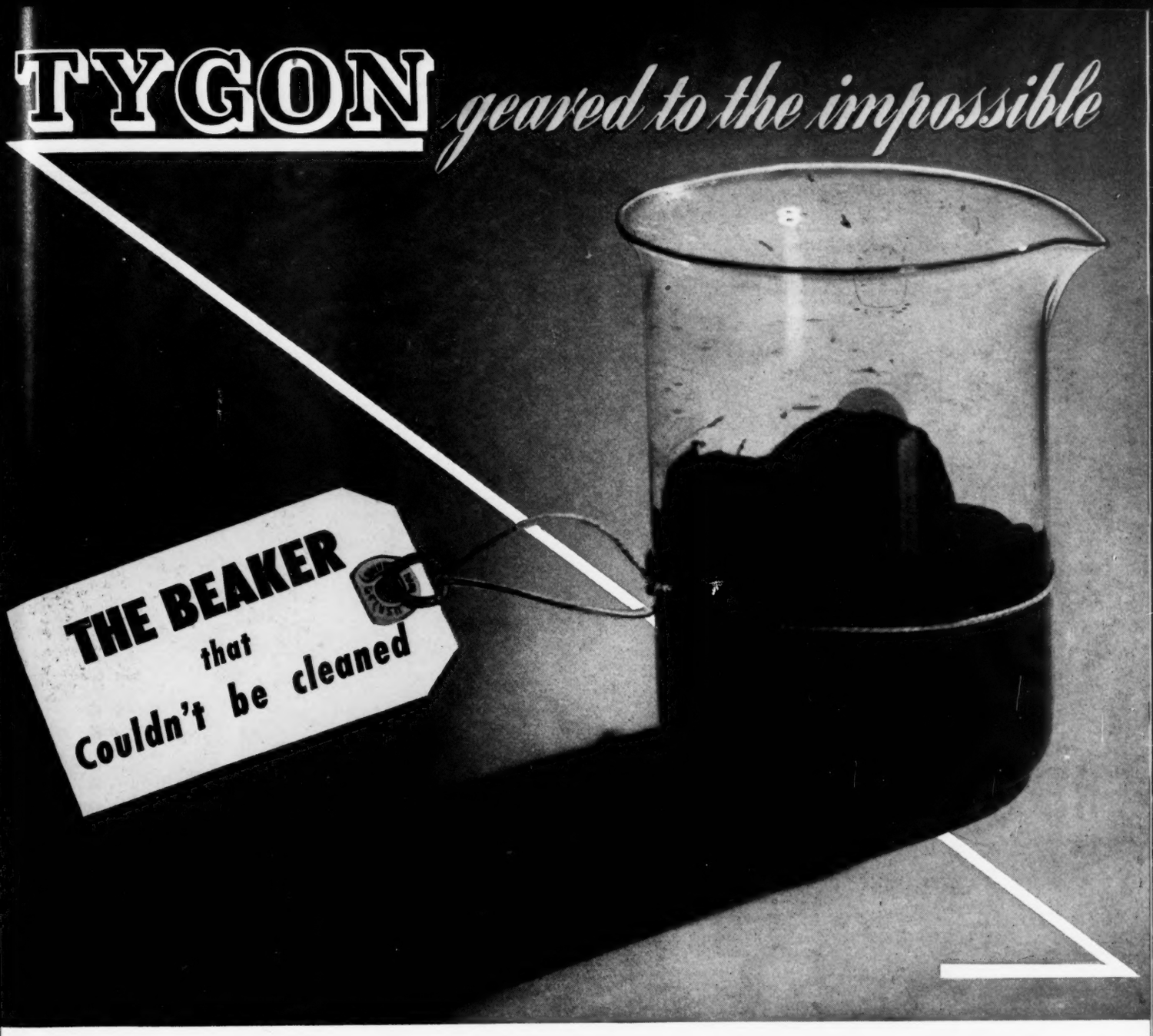
Reorganizing the Flow of Raw Materials: In the first frenzied months of war production effort little was known about the actual relative manufacturing capacities of the hundreds of industries whose combined efforts were of paramount importance. It is true that output generally expanded at a highly encouraging rate, but this inevitably led to an unbalanced production and resulted in many bottlenecks caused by the lack of sufficient raw materials.

It seemed wise then and perhaps was not only good policy but good showmanship to let the various industries and the companies within these industries produce just as much and just as fast as they could. There were several weaknesses, however, principally the tendency to erect quietly productive capacities in excess of that required or expected in order to make excellent individual company records of achievements, and secondly to build up large inventories of raw materials. Thirdly this policy at least in certain industries led to pirating of labor and technical and management brains.

And so we move along another step in all-out industrialized war. Priorities will shortly be a thing of the past. Washington will dictate just how much is to be made of this and that war material and will see to it that the raw materials and semi-finished raw materials necessary are divided in accordance with the amounts available and the urgency of the finished materials. The addition of Wilson of General Electric and Eberstadt to the WPB set-up is definite indication that the former systems (The Production Requirements Plan and the Allocation Classification System) governing the flow of materials into industry are to be shelved promptly. At the moment not all of the details of the "scheduled production" plan have been completely formulated. One thing is certain, however, and that is civilian needs and production not considered vital to the war effort will be "pared down to the bone."

Outlook In Synthetic Rubber: The Baruch Committee's report (at least that portion of it which was released) appears to be what is was fully expected to be —a factual and fearless discussion of the problems free from bias and politics even though a few diehards, including certain members of the farm bloc and New York's vociferous *PM*, are not at all pleased. Mistakes have been made it is true and it is only to be expected in any such rushed program that a number would be made, but the entire country is greatly relieved to hear William M. Jeffers, now in charge of the rubber program, report that the situation is not nearly as bad as he had expected it to be. Let the technical men now get down to business without further time out for political debates.

TYGON *geared to the impossible*



NOT until the development of U. S. Stoneware's bonding process had there been a really satisfactory method of adhering synthetic linings to steel.

Adhesion of synthetics had been an object of intense research for sometime . . . its actual discovery, however, was the result of our observations noted during the running of a special laboratory corrosion test. While Tygon is unaffected by most chemicals, it is slowly attacked by a few. A sample of one of the Tygons, placed in a test beaker containing a combination of these few substances, was examined on completion of the test. A thin film on the beaker defied all normal methods of removal. Even more amazing, the film could not be removed from the polished glass surface by ordinary mechanical means.

The key found, it was not long until the door was open to a wide new range of Tygon applications, heretofore impossible. The new bonding process required neither curing nor vulcanizing to form a bond. Hence, field applications of Tygon to tanks of the largest size became practical. In fact, the largest installation of lined equipment in the world is Tygon-lined, and was done in the field — an installation that required the amazing total of more than 180,000 square feet of Tygon lining.

Being flexible, Tygon adapts itself to the contour of the equipment to which it is bonded. Tygon can be applied to equipment of any shape, any size . . . and Tygon bonds to steel with a tenacity almost unbelievable. It doesn't blister, or buckle . . . or separate under impact, or under the strain of high centrifugal force.

Would you like to learn more about this versatile material, and how its advantages can be applied to your processes? Write today, to, The United States Stoneware Company, Engineering Department, Akron, Ohio.

US STONEWARE
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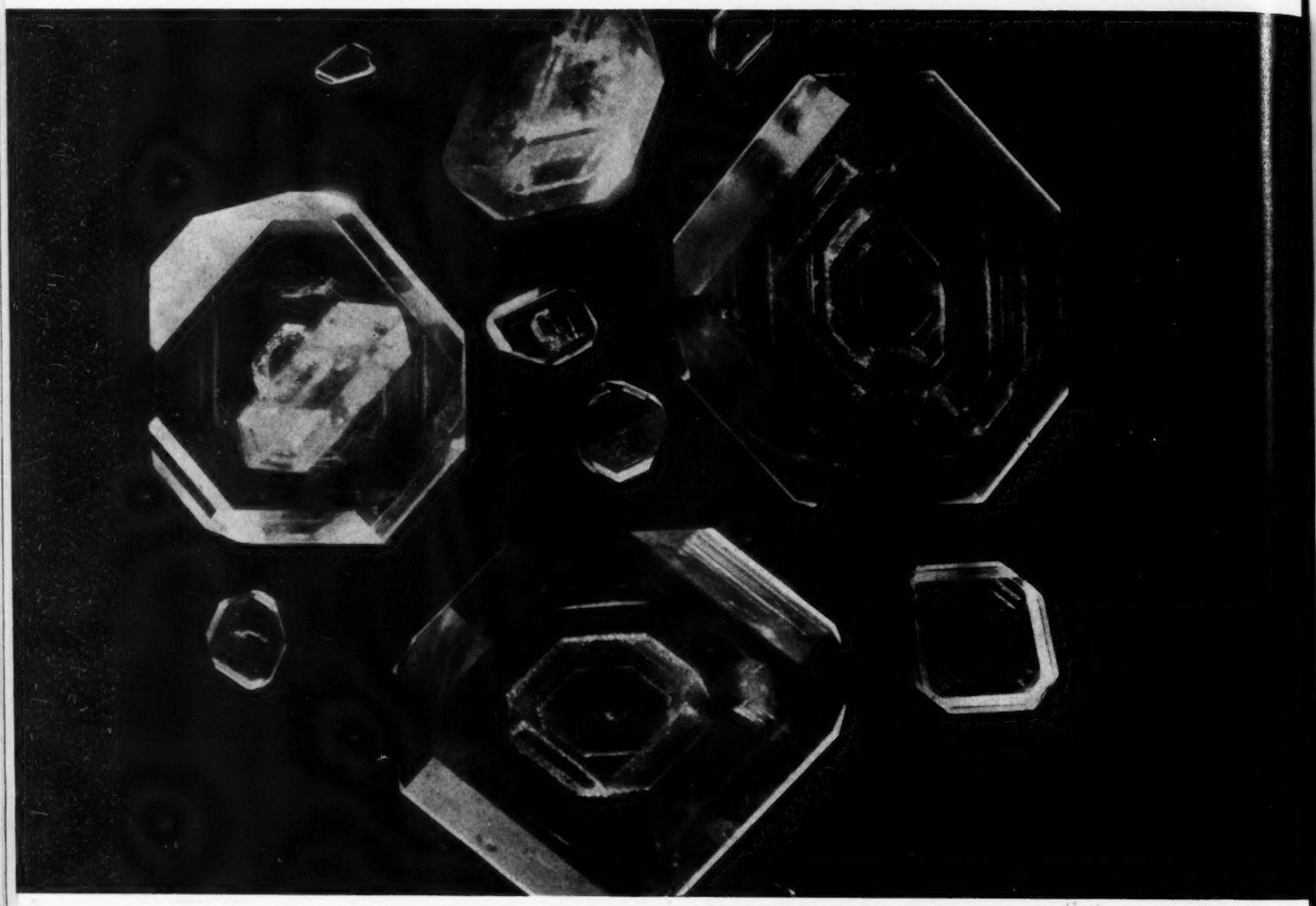
LINED EQUIPMENT • ACID PROOF MASONRY • ALLOY EQUIPMENT • CHEMICAL STONEWARE

WORKS:
AKRON, OHIO

Since 1865

Sulfamic Acid



Large sulfamic acid crystals magnified 1½ times.

JUST a year ago large scale production was started on a new industrial acid which, for some 66 years, was virtually a useless laboratory curiosity. Possessed of certain unusual properties, sulfamic acid and its commercial companion, ammonium sulfate, quickly established themselves. Today, despite carload quantity manufacture at an Eastern Du Pont plant—the first and only one of its kind in the world—production is striving to keep up with wartime demand.

Starting point of this success story was the discovery in 1938 in Du Pont halls of research of a process which permitted economical production. Urea and fuming sulfuric acid, mixed in the right proportions under closely controlled temperatures, opened the doors to the marts of trade for sulfamic acid.

Once there, the newcomer attracted attention because of its remarkable chemical character which formed the basis for a wide variety of industrial applications ranging from weed killing to flameproofing.

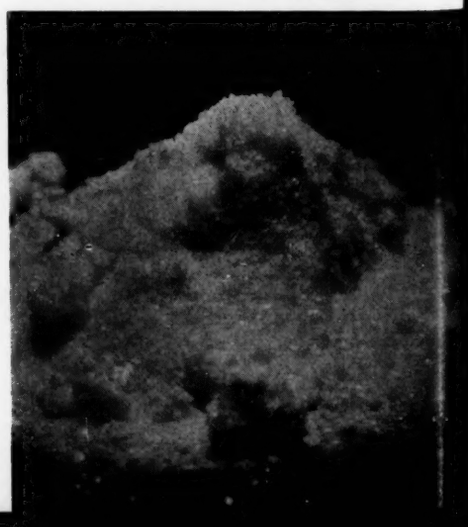
Sulfamic acid is a white crystalline solid. It is also a non-volatile, nonhygroscopic, and odorless product that may be easily handled and packaged commercially. In aqueous solution it is highly ionized, forming strongly acidic solutions.

All the known salts of sulfamic acid, with the single exception of a basic mercury salt are soluble in water.

For example, the lead, magnesium and

Sulfamic acid is a white solid, nonvolatile, non-hygroscopic, odorless and easily handled and packaged. In water it forms a strong acid solution.

Sulfamic acid, for 66 years a laboratory curiosity now has many commercial uses ranging from weed killing to flame proofing. Production can hardly meet demand.



A NEWCOMER IN THE CHEMICAL FIELD

By Allan Perry, *E. I. du Pont de Nemours & Co.*

sodium salts of sulfamic acid are among the most highly soluble salts known, being considerably more soluble than the corresponding nitrate, acetate, chloride or sulfate salts. Ammonium sulfamate and many substituted amine sulfamate salts show excellent solubility in glycerol, glycols and formamide. Ammonium sulfamate is about five times more soluble in water than ammonium chloride.

It appears evident on the basis of animal feeding tests that both the acid and the ammonium salt are non-toxic. Using reasonable care the chemicals may be safely handled.

An effective demonstration of the non-hygroscopic, non-volatile nature of sulfamic acid is afforded by a large crystal of sulfamic acid similar to those shown in the photograph. This crystal was prepared several years ago by slowly evaporating from a wax-coated container, a saturated solution of sulfamic acid, seeded with a single small crystal of the acid.

In April, 1938, soon after its preparation, this crystal was exhibited at the meeting of the American Chemical Society at Dallas, Texas. Since that time it has been stored under ordinary room conditions, wrapped in cheese cloth. Except for slight loss in luster, this crystal has retained its original appearance.

Among the more important practical applications for sulfamic acid and its salts are: nitrite removal; flameproofing of fabrics and paper; laboratory reagents; leather tanning; weed killing; and electroplating and refining metals.

Nitrite Removal

One of the first industrial applications developed for sulfamic acid is based on its reaction with nitrous acid, which is exceedingly rapid and proceeds quantitatively. This is of direct commercial interest in eliminating the excess nitrite employed in diazotization reactions for dye and colored pigment manufacture.

In a representative pigment manufacturing process which originally required 25 pounds of urea and a period of three hours to complete the excess nitrite removal, four pounds of sulfamic acid now complete the same reaction in about five minutes. Similar results are obtained in azo dye manufacture. In such procedures a larger excess of nitrite may frequently be employed to facilitate the diazotization. Because the reaction may be more closely controlled, cleaner shades of color with better uniformity in batches are possible. The advantages of these procedures are now being extended to other fields such as in the application of developed colors to textiles and leather.

Flameproofing

The sulfamates are highly compatible with cellulose and have been extensively evaluated as flameproofing agents. Ammonium sulfamate is unique among ordinary fire retardants because it does not cause stiffening or otherwise adversely affect the appearance or texture of fabrics and paper. The sulfamates show no tendency to crystallize on the surface of the flameproofed article on aging.

Flameproofed draperies which are often exposed to wide variations in temperatures and humidity show no efflorescence upon the surface. Fire retardants are now being used for flameproofing service clothing, drapes, curtains, decorative materials, blankets, wearing apparel, and protective work clothing and accessories such as gloves, helmets and aprons.

Laboratory Reagent

Another general application for sul

Below left, even a blow-torch cannot ignite this treated blackout curtain. Below right, Heavy growth of poison ivy being sprayed with ammonium sulfamate to kill it. Right, spraying hangings with fire retardant solution to make them flame proof. Above right, the flame-proofed cloth is not affected.

famic acid is its use as a laboratory reagent in both industrial and institutional laboratories. A number of such possible uses are: titrimetric standard; diazotization reactions; analytical procedures for nitrite analysis; oxygen in water analysis; and extraction of rare earth metals.

Leather Tanning

It has been found that skins processed with sulfamic acid have a finer and silkier grain than those prepared with sulfuric acid. The sulfamic acid also gives a tighter skin and produces better suede when working with goatskin tanned with formaldehyde. The calcium sulfamate formed in the processing is highly soluble so that there is less tendency toward lime spots compared with the use of sulfuric acid.

In the leather pickling operation in which hides are converted from an alkaline to an acid condition for prolonged preservation, a portion or all of the sulfuric acid may be replaced with sulfamic acid, depending upon the results desired. Increased replacement with sulfamic acid yields leather showing a more attractive grain and better working qualities.

In the regular bating procedure the hides are subjected to the action of enzymes to remove hair follicles and extraneous matter. In this operation approximately one-fourth per cent of sulfamic acid is added to the skins placed in the bating paddle. The amount is based on the weight of hides and the regular amount of bating material or similar products. The temperature should be allowed to rise to the normal used in the tannery, which may vary between 90° and 95°F. If the bating material does not contain ammonium salts, it is desirable to add a small amount of ammonium chloride or sulfate to the bate to prevent surface hardness. The leather produced with sulfamic acid, according to the above procedure, shows a fine and silky grain which is retained throughout the subsequent finishing operation.

Weed Killing

About five years ago the evaluation of sulfamic acid and its salts as weed-killers was first initiated. Preliminary reports of this work stimulated a large number of field tests throughout this country and abroad. Highly favorable results are indicated in the reports of practically all of these investigations.

Ammonium sulfamate has shown a much greater herbicidal action than ammonium sulfate, ammonium thiocyanate, sodium chloride or calcium chloride. It is equally as effective as sodium chlorate, and on some weeds is better.

The killing effect of the ammonium salt—used as a spray in concentrations of about one pound per gallon of water—is probably associated with translocation of the salt into the plant structures through the leaf tissues. In this manner, it is possible to eradicate certain hardy deep-rooted perennials without resorting to laborious and not always successful labor with spade and grub hook.

The weed-killer has been found especially suitable in combatting the menace of poison ivy. Where the presence of the three-leafed villain in orchards represents a serious hazard to spraying crews, ammonium sulfamate has been welcomed. More often than not permanent kill is achieved with a single, thorough wetting of the foliage. While the ensuing spring may find a few shoots reappearing, a follow-up application promptly completes the eradication job.

In many localities wild cherry is especially obnoxious because it serves as the host for orchard diseases and insect pests. Ammonium sulfamate serves as an easy and effective control, for the herbicide is transferred from the leaf surfaces down the trunk to the root system destroying as it progresses.

Ammonium sulfamate has also proved effective for controlling poison oak, Canada thistle and chokecherry. In addition to its outstanding herbicidal action, ammonium sulfamate has several other advantages as a weed-killer. It apparently is rapidly decomposed by bacteria in the soil so that it may be applied without danger of long-time soil sterilization. It may therefore be used to advantage in places where plants are subsequently grown.

Electroplating & Refining Metals

Recent publications have indicated that sulfamic acid performs satisfactorily under certain conditions when used for electroplating metals or for refining metals by electrochemical procedures. Metals such as copper, silver, iron, nickel, cobalt, cadmium, zinc and lead have been satisfactorily plated in smooth deposits from sulfamic acid solutions.

Certain advantages over fluosilicic acid have also been noted in the refining of lead. For example, sulfamic acid is more easily handled commercially, and its solutions may be used in ceramic containers or asphalt-coated wood containers. However, further practical testing is required before sulfamic acid will be extensively used in this field.

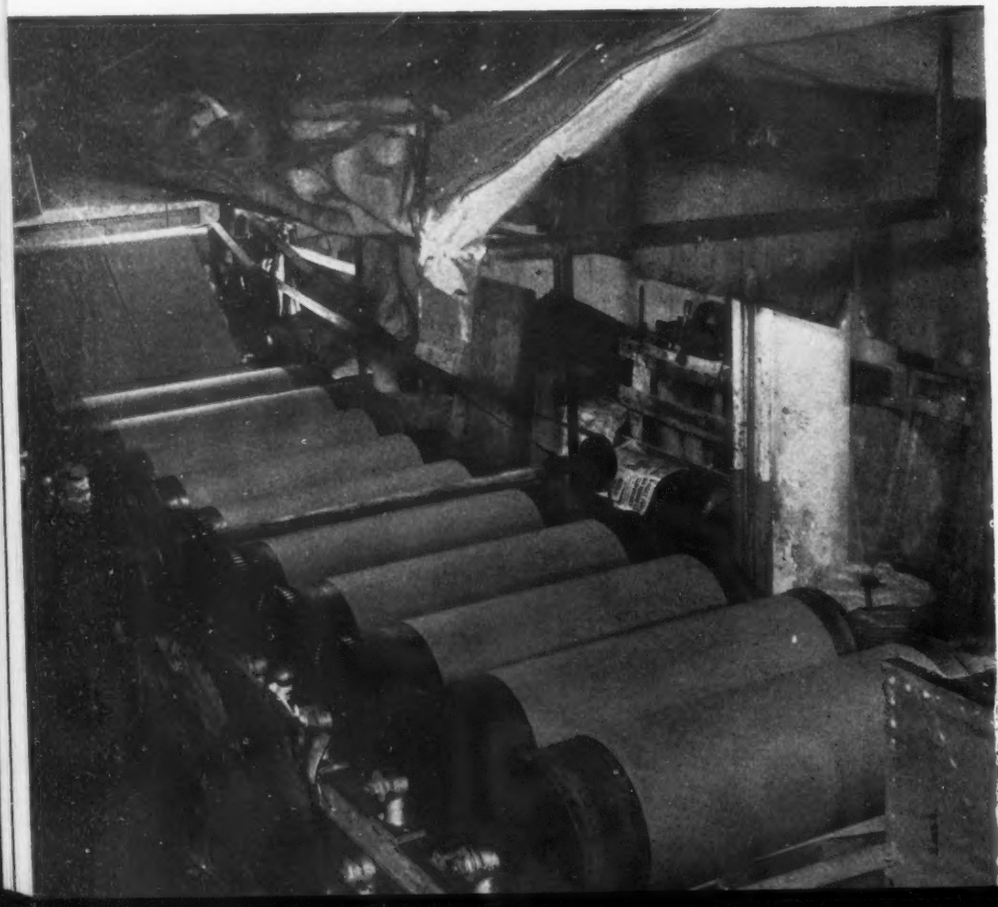
Miscellaneous Uses

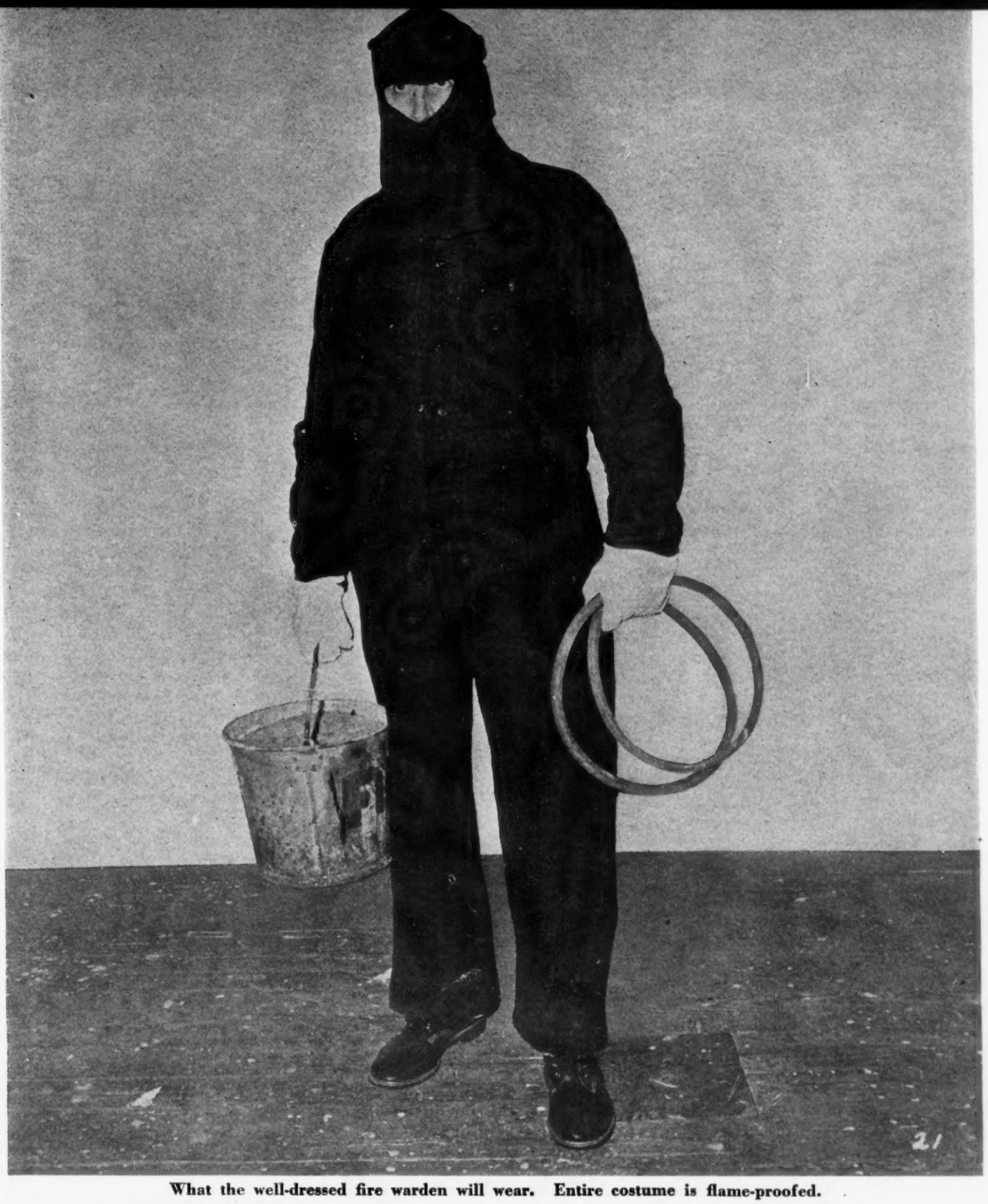
Miscellaneous proposed uses for sulfamic acid which have been disclosed in the patent literature are:

- Washing rinse or fixing agent for textile dyes
- Gas-liberating compositions
- Metal-polishing compositions
- Photographic fixing baths
- Photographic bleaching baths
- Solubilizing high molecular weight amines
- Solubilizing polymeric amines
- Peptizing pigments
- Polymerizing of olefines
- Acidizing oil wells

Use of the sulfamates has been suggested for the following:

Fabric wetted in fire retardant tank rolls over a series of internally heated drums drying and ironing out cloth. All types of textile goods may be made flameproof by either this dipping or the spray method. (See the foregoing page.)





What the well-dressed fire warden will wear. Entire costume is flame-proofed.

Anti-gelation agent for soap solutions
Preparing phthalocyanine pigments
Preparing guanidine sulfamate
Textile-finishing agent

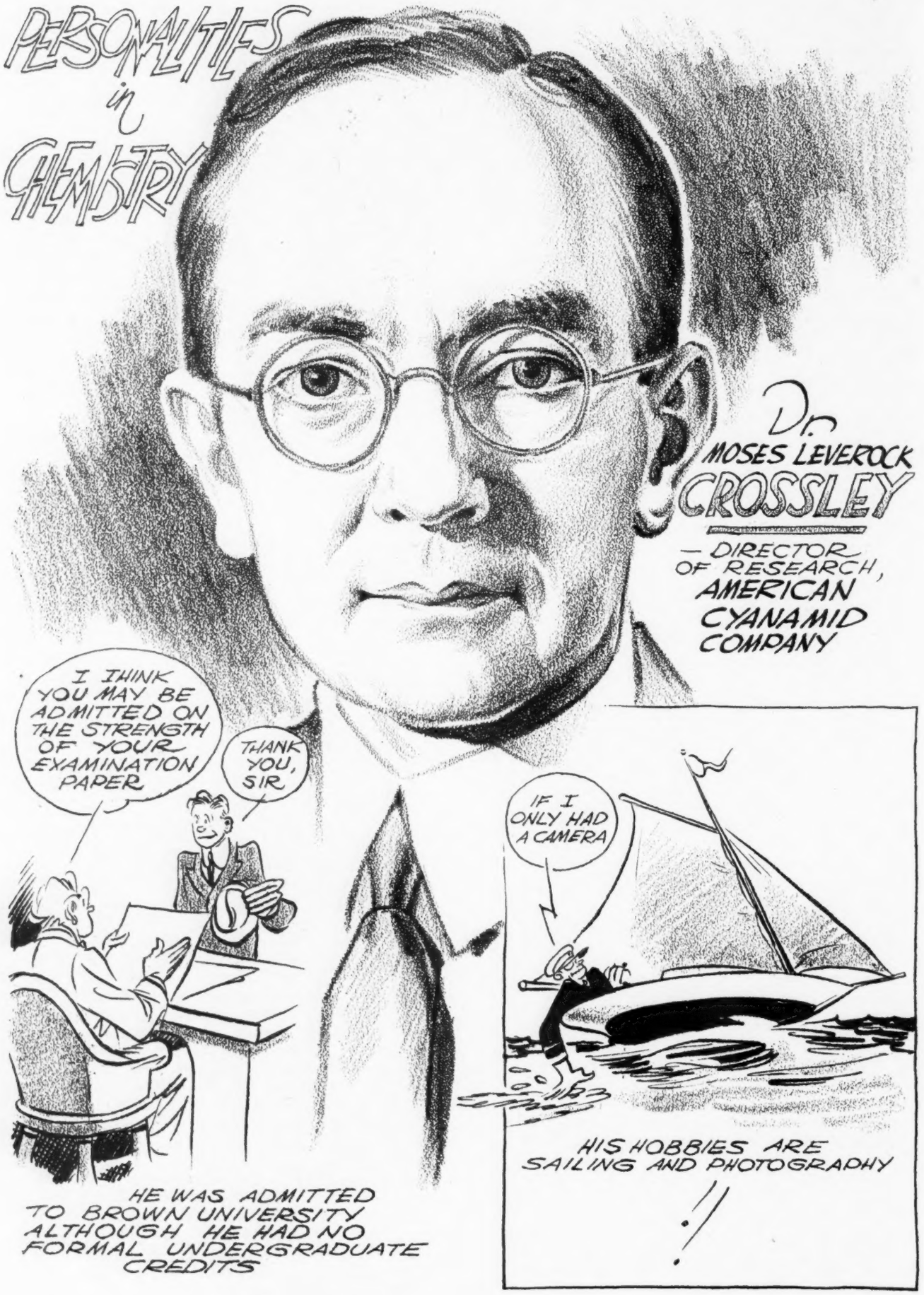
In each of the miscellaneous applications one or more of the advantageous properties of sulfamic acid or its salts is utilized.

In small package textile dye preparations, which may be purchased for home applications, a solid acid ingredient is often included in the package for fixing the dye at the end of the dyeing process. For such usage the acid must be crystalline and non-hygroscopic, and preferably show high ionization in water. Sulfamic acid meets these requirements.

Certain gas-liberating compositions have the advantage that they are comparatively stable in the dry, solid form but readily react when water is added. Metal-polishing compositions, in some instances, have shown improved scouring and polishing properties when sulfamic acid is used as the acid ingredient. These particular uses show advantages mainly based on the ease of handling this acid commercially and on its ability to form strongly acid solutions or highly soluble salts.

Another possible use depends on the ability of ammonium sulfamate to decrease the gelation tendency of soap solutions. This anti-gelation effect of the sulfamate ion has been noted in other colloidal systems and may well find specific industrial applications.

In conclusion, it may be said that this strong acid, by virtue of its unusual properties, represents an important addition to the commercial acids represented by the lactic acetic, formic, tartaric, oxalic group. Its beginnings have been auspicious and its value has only begun to be explored.


PERSONALITIES in CHEMISTRY
Dr.
MOSES LEVEROCK
CROSSLEY
— DIRECTOR OF RESEARCH, AMERICAN CYANAMID COMPANY
I THINK YOU MAY BE ADMITTED ON THE STRENGTH OF YOUR EXAMINATION PAPER
THANK YOU, SIR
HE WAS ADMITTED TO BROWN UNIVERSITY ALTHOUGH HE HAD NO FORMAL UNDERGRADUATE CREDITS
IF I ONLY HAD A CAMERA
HIS HOBBIES ARE SAILING AND PHOTOGRAPHY
!!

MOSES LEVEROCK CROSSLEY

By
A. D. McFadyen

AMONG the applicants for admission to Brown University in the fall of 1904 was an extremely modest lad named Moses Leverock Crossley. He could present no formal undergraduate credits and asked to be admitted to the University upon examination. He informed the dean that he hailed from Saba Island, Dutch West Indies, where his American father was a mining engineer connected with one of the sulfur companies; that his early training on the island was restricted to the three R's, and aside from such and one course in geometry in a Providence night school, all his other training resulted from tutoring by his parents and by himself.

It seems that the dean was much impressed by the personality, sincerity and alertness of young Crossley, as well as by the surprising wealth of information revealed on examination, and after due deliberation he was allowed to matriculate, electing the pre-medical course. Within six weeks the death of Crossley's father forced a temporary abandonment of his studies in favor of a job. After two years as laborer and in the office of Builders' Iron Foundry, he was able to accumulate sufficient funds so he could resume his university studies in the fall of 1906. Both to conserve his money and to regain lost time, Crossley registered anew as a special student. This enabled him to increase his courses by some fifty per cent., and at the same time to select those subjects most appealing to his needs.. Besides his heavy studies Crossley continued some of his outside office work, as well as teaching in night schools of Pawtucket and Providence. His efforts attracted the attention of Professor Appleton, of the department of chemistry, who made it possible for him to use the laboratory during the summer to accumulate more credits toward his degree. In the end he was awarded the Bachelor's Degree in 1909. Accepting a position as an instructor he was enabled to remain two more years at Brown. He was rewarded with his Master's degree and election to Sigma Xi in 1910, and his Doctorate degree in 1911. He thus completed the usual seven-year course in five years, including elective courses in languages, public speaking, economics, history, philosophy, psychology, etc. Years later Brown's initial appraisal of Crossley was reaffirmed when he was presented one of the first "Brown Bear" awards—a tribute to a distinguished alumnus.

The association with Professor Appleton seems to have diverted Crossley from medicine to chemical research, and his interest in chemical research has extended, in general, to two major fields. His primary interest in medicine at once led him into physiological chemistry and to the teaching of phases of chemistry intimately related to medicine. Professor Appleton's specialty was the study of the relation of molecular structure to color in dyes, and through the professor's enthusiasm over the subject Crossley ultimately became fascinated by the chemistry of aromatic compounds, and this added a second subject to his primary interest.

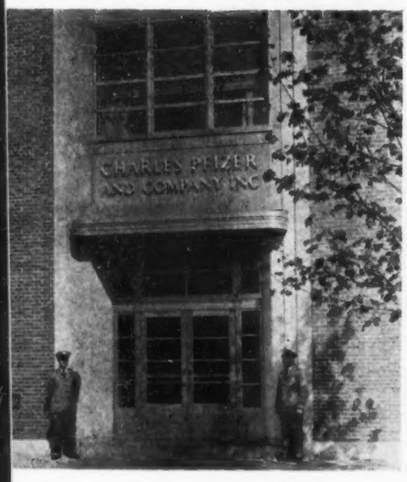
Even at Brown, Crossley was busy with research in physiological chemistry. The functions of creatinine in metabolism was one of his early investigations. Later this groundwork was to bear fruit in his contributions in the field of sulfanilamide derivative drugs, which just now are assuming paramount importance in the treatment of wounds and infections arising from the present war. Crossley has directed research on these drugs, as well as on methylene blue, para-amidophenol, cincophen, the chloramines, and hosts of other products, for the Calco Chemical Company, later a division of the American Cyanamid Company, producer of these drugs in quantity. His interest in and knowledge of medicine has been of invaluable assistance to him in this work, concerning which he is a recognized authority.

Upon receiving the doctor's degree, Crossley went to William Jewel College as associate professor of chemistry. After two years at Jewel, the chemistry building was destroyed by fire. Almost simultaneously he was called to Wesleyan University, serving there in turn as lecturer, associate professor, and head of the department of chemistry until 1918. During all this period research occupied much of his time, and during some of the summer vacations he returned to Providence, where he worked with Professor Appleton. Though he does not use tobacco (and is not especially "agin" it), one of these investigations was directed toward learning the physiological effects of smoking. Meanwhile he was being called upon by industry from time to time for assistance in industrial problems, and his interest in fundamental research shifted, somewhat, toward its application in industry. From 1915 to 1918 he was a consultant for the Barrett Company.

Then came World War I and the vast expansion of American chemical industries, with resultant demand for high-grade chemists in industry. Calco Chemical Company learned of Crossley's intimate knowledge of dyes and chemotherapy—the chief fields of Calco. Crossley seemed tailor-made for the needs of the company and vice versa, and so he was lured from the classroom to become successively chief chemist (1918-36) and director of research (1936) of that organization. The time thus arrived when Crossley was impelled to forego his own love for tinkering in the laboratory, and to use other men as his tools. Gifted in analyzing

(*Continued on page 557*)

Pfizer Opens New Building



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CHAS. Pfizer & Co. Inc. has recently completed the erection of a new laboratory and office building at 11 Bartlett Street, Brooklyn. This new structure provides the latest facilities for its research and analytical staffs and, in addition, makes possible close cooperation between different departments, since the plant executive offices, library and information department, technical service, engineering, accounting, and purchasing departments are all housed under this same roof.

The building consists of four stories surmounted by a tower, the latter serving a utilitarian as well as a decorative purpose. The street facade is of brick with continuous limestone sills, ornamentation being provided by the use of metal in casements, doorway and canopy and by metal panels over the entrance.

For convenience the purchasing department has been located on the first floor adjacent to the entrance lobby. The rear of this floor is given over to storage rooms, including that supplying chemicals and glassware to all the laboratories, a vault, and a room housing the mechanical equipment supplying the various laboratory services. Access to the various mains entering the building is also provided in this section. Two staircases, and a self-operating, high speed Otis elevator lead to the upper floors.

On the second floor are the offices of the plant executives and those of the accounting and engineering departments. The third floor contains the laboratories and offices of the analytical and technical service departments, the library, and three of the laboratories for biochemical research. The fourth floor has been given over entirely to the research department.

For the research department there have been provided fourteen individual laboratories, each with average floor space of about 400 square feet, together with an office and a private laboratory for the Director.

The laboratory benches and furniture are of lead-coated steel, the benches having "Alberene" stone tops. The benches were built up from the various standard units available so that a variety of sizes of drawers and storage spaces are provided. There are outlets for gas, compressed air, vacuum, steam, electricity, and water on each bench. In addition, hot water and distilled water are available in each laboratory. Each also is fitted with glass evactors, actuated by constant high-pressure water, for use in vacuum evaporations. Additional features are steam cones for heating and water baths for cooling, located on the benches.

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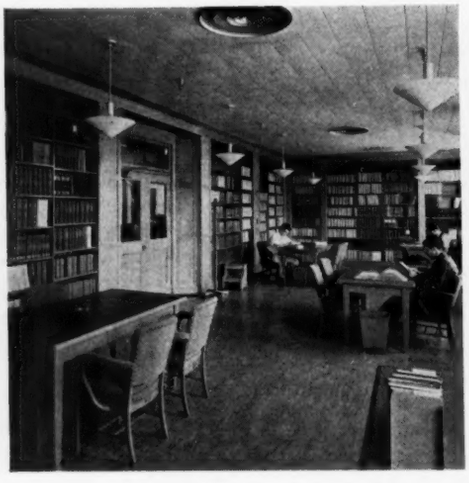

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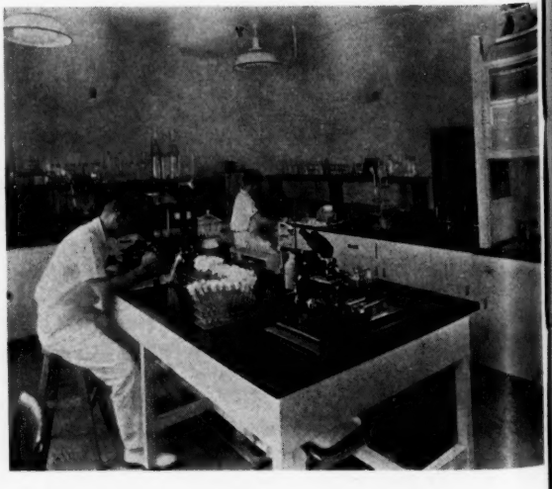
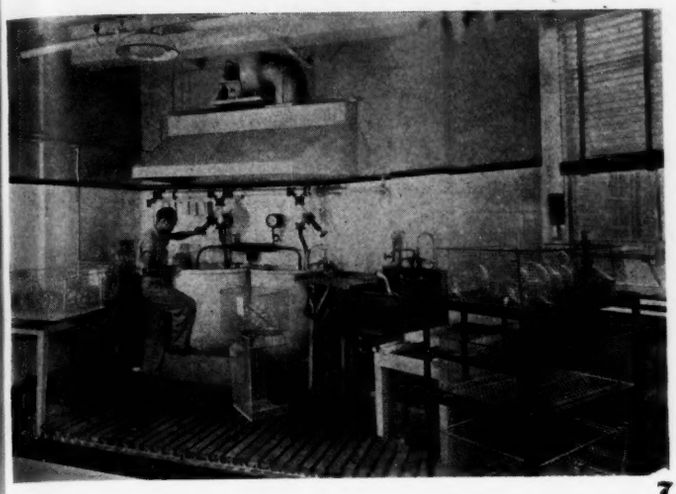


By G. O. Cragwall and W. H. Staebner



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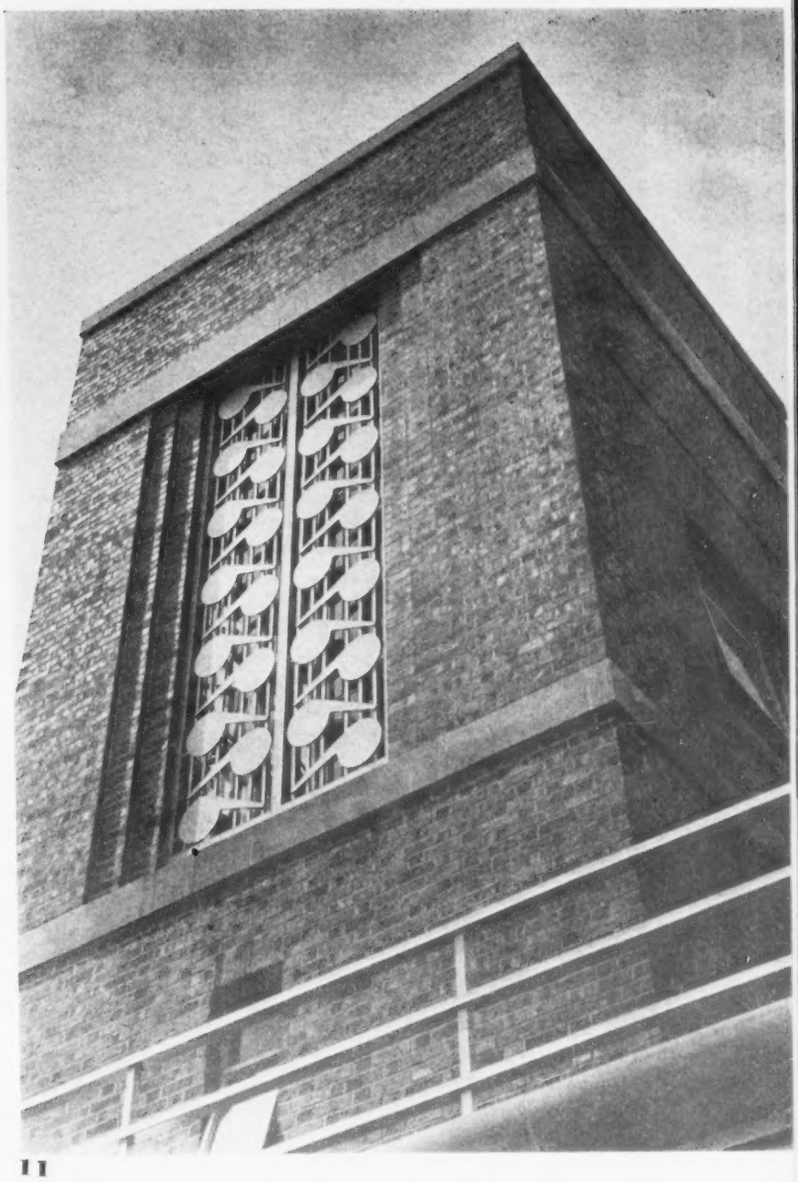

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(1) Entrance to the new laboratory and office building. (2) Executive office. (3) Building front view. (4) General analytical laboratories. (5) Library. (6) Biochemical research laboratory. (7) Apparatus washroom. (8) Office and private laboratory of director of research. (9) Chemical stock room. (10) Entrance lobby. (11) Tower.

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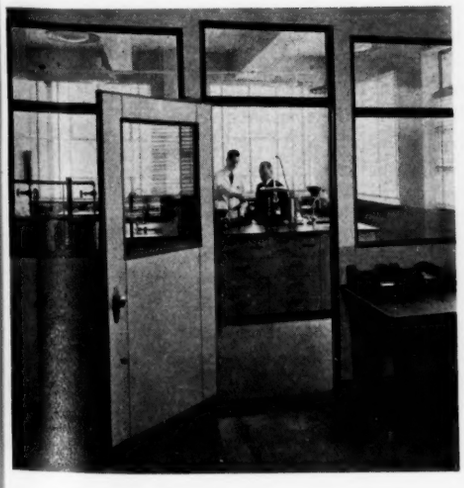

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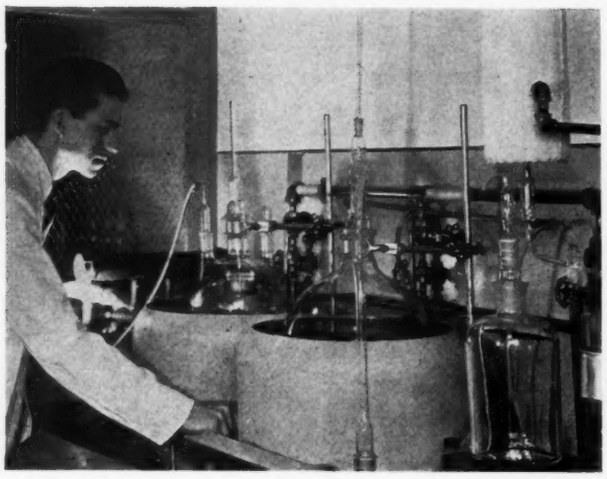
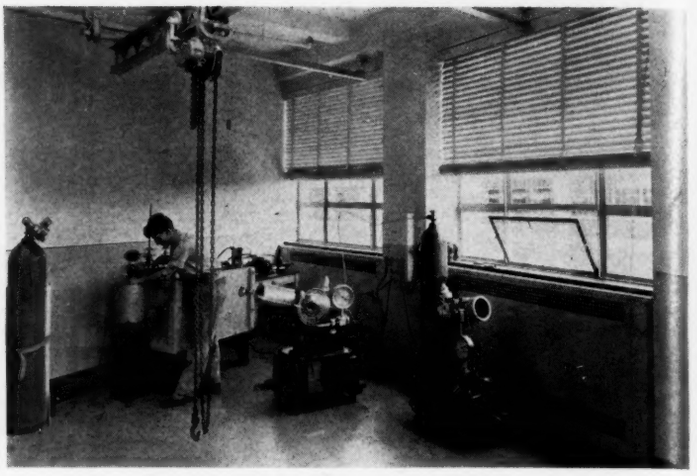


A corner of the research laboratory.



Autoclave room of the new building.

Each laboratory has its own hood, of Transite with reinforced glass sides and doors. Ventilation is by individual fans, exhausting into a Durimet stack. Vents to the fan are at both the top and bottom of the hood, thus removing gases both lighter and heavier than air. In each there are outlets for vacuum, gas, and electricity, together with a steam bath. The space beneath the hood has been utilized as a drying cabinet, heated by means of a steam coil, vapors evolved venting into the hood.

There are storage rooms for inflammable materials and for laboratory chemicals and glassware. These latter are stored in numbered metal cabinets. An index and continuous inventory system makes the location of any item a matter of seconds and indicates when the stock is sufficiently depleted that reordering is advisable.

In addition there are several rooms fitted out for special purposes. In that for autoclaves and other pressure equipment, a traveling chain hoist has been installed to facilitate lifting and moving heavy pieces of equipment. Electric furnaces and combustion apparatus are all housed in one room, while a third has been fitted out for glass blowing, and as a workshop.

A separate room has been fitted out for cleaning all glassware. The apparatus to be cleaned is removed to this room and after a preliminary rinsing, placed in a stoneware vat. Chromic acid solution is then pumped in from a storage vat and the cleaning accomplished by warming the solution by means of a lead steam coil. The apparatus is then rinsed, finally with distilled water, dried in a steam heated cabinet, and returned to the laboratory.

Analytical Laboratories

These consist of the combined office and laboratory of the department head, a large general laboratory, three for analytical research and special analyses, and four air-conditioned special laboratories.

In the general laboratory a bench along the north side has been fitted for titrations, ample north light being provided by the large industrial-type windows which it faces. Four large benches at right angles to the opposite wall provide space for other analytical work; balance and desk tables are placed at the ends of these.

The air-conditioned section is subdivided into: (1) the microchemical laboratory, (2) physical chemistry laboratory, (3) spectrographic laboratory, and (4) a special laboratory for analytical or research investigations requiring controlled temperature and humidity. It is believed that air-conditioning will prevent corrosion of the delicate instruments employed in these laboratories and will obviate inaccuracies which might be introduced by variations in temperature.

Other rooms for this department include one for the storage of file samples, and one for laboratory screening operations and tests. Laboratory milling operations are carried out in a room on the roof at the base of the tower.

The laboratory benches, furniture and fittings are similar to those of the research laboratories except that in the special laboratories the bench tops are of hardwood, impregnated to prevent warping.

Other Laboratories and Library

Also located on the third floor are three of the laboratories of the biochemical research department and that of the technical service department. Installations and fittings are similar to those of the other laboratories, modified somewhat in the case of the biochemical laboratories because of the specialized nature of the research.

The library has been air-conditioned, the inlet and outlet ducts having been so sized that a slight positive pressure is maintained, thus preventing the infiltration of dust from the outside. This in turn makes it possible to store the books on open shelves for convenient and easy access. Space has been provided for over 5,000 volumes; in addition, files are maintained of patents, pamphlets, clippings, photostats, translations, etc.

Construction and Engineering Details

Due to poor subsoil conditions, it was necessary to drive piles to serve as a foundation. Two hundred and thirty-six Raymond concrete piles, each designed to carry a load of 30 tons, were used for the area of approximately 174 feet by 75 feet.

The building itself is fireproof throughout, the framework being of structural steel with cinder concrete arches, carrying a live load of 75 lbs. per square foot. The floors are of reinforced concrete and the room partitions of hollow tile, plaster-coated. The total floor area amounts to about 43,000 square feet.

Throughout the building the floors are covered with Battleship linoleum. The resiliency of this floor covering has proved of considerable value in preventing fatigue. Attack by spilled reagents and solvents has been largely obviated by frequent waxing.

Except on the top floor, Sanacoustic ceilings have been installed, for additional soundproofing; these are of the perforated type in the offices, library, and conference rooms. It has thus been possible to completely hide all piping since it is carried between the false ceiling and the floor above. Although concealed, the piping is readily accessible for repairs on removing the necessary Sanacoustic sections.

The mains for the piping are located in the hollow tile walls of the building. Headers at each floor are in the form of

Above, balance table. Below, floor plans of the third and fourth floors on which the laboratories and technical service department are located.

loops extending entirely around the building and reconnecting with the main. This arrangement prevents any large drop in pressure or volume at locations remote from the main.

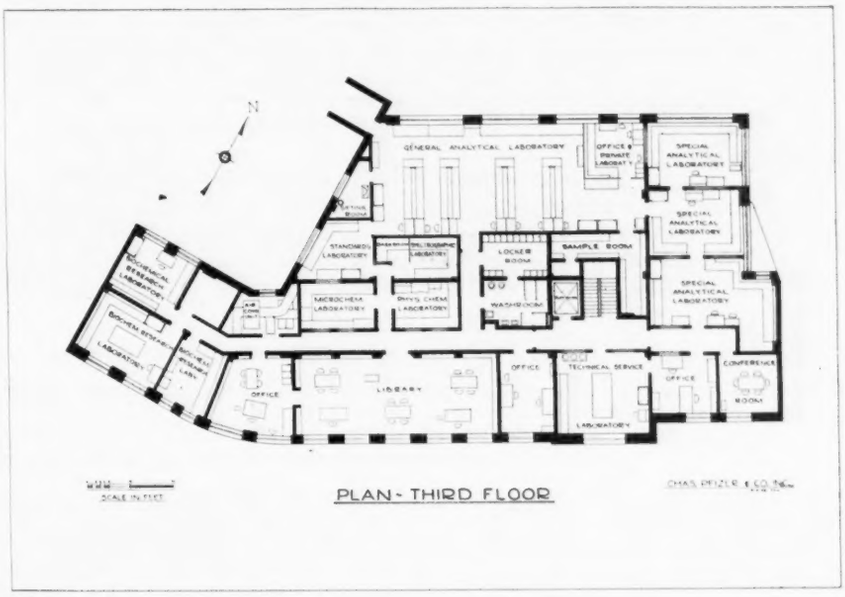
Block tin piping and tin-lined valves are used for distilled water. The distilled water unit, located in the tower, consists of a steam-operated, automatic Barnstead still and a tin-lined storage tank.

Also in the tower is the Croll-Reynolds single stage steam evactor which furnishes vacuum for general use in all laboratories. Vacuum for evaporations is supplied by glass evactors, in each laboratory, actuated by water under constant high pressure. This is furnished by two pumps so arranged that should one fail the other starts automatically.

Special precautions have been taken to insure that the compressed air, supplied all laboratories at 40 lbs. pressure, is clean, dry, and free from oil. The compressor is fitted with both inlet and outlet air filters and an after-cooler has been installed to remove moisture. To insure freedom from oil, the piston is of aluminum with segmented carbon rings.

Lighting has been designed to yield 35 to 40 foot-candles on the working plane. To overcome the heating effect of the usual type light, fluorescent lighting has been installed in the special air-conditioned laboratories. This type of lighting obviates errors, induced by radiant heat, which might otherwise occur in the operation of the sensitive equipment used in these laboratories, and also relieves the load on the air-conditioning units. Full advantage is also taken of the natural light available by the use of large industrial-type windows.

Although fireproof the building has been equipped with a sprinkler system. An additional safety feature is the quick-opening, high-pressure shower located at the door of each research laboratory.



PLAN - THIRD FLOOR

PLAN - FOURTH FLOOR

The
ALKYL ESTERS OF PHOSPHORIC ACID

By Howard Adler and Willard H. Woodstock
Victor Chemical Works

Large scale production of phosphoric anhydride, dehydrated phosphoric acids and the phosphorus chlorides has made possible the inexpensive manufacture of many organic phosphorus compounds. This article shows well some applications in industry for these compounds.

THE organic phosphorus compounds are much less familiar in the industrial field than the inorganic phosphorus compounds. A few of the former have found very important uses, for example, triphenyl and tricresyl phosphates as plasticizers, the dithiophosphates as flotation agents, and to a lesser extent, triphenyl and tributyl phosphites as antioxidants, but they represent only a small fraction of the large number of organic phosphorus compounds that are known. It is among these many organic derivatives of phosphorus that new applications are constantly being found. Furthermore, their continued growth can be anticipated due to the expansion in production of phosphoric anhydride and the phosphorus chlorides which serve as raw materials for their manufacture. The last few years have witnessed a marked increase in research on the alkyl esters of phosphoric acid in particular, and the purpose of this paper is to give a review of the recent advances in our knowledge of their preparation, properties, and possible uses, in the hope that expanded industrial interest will result.

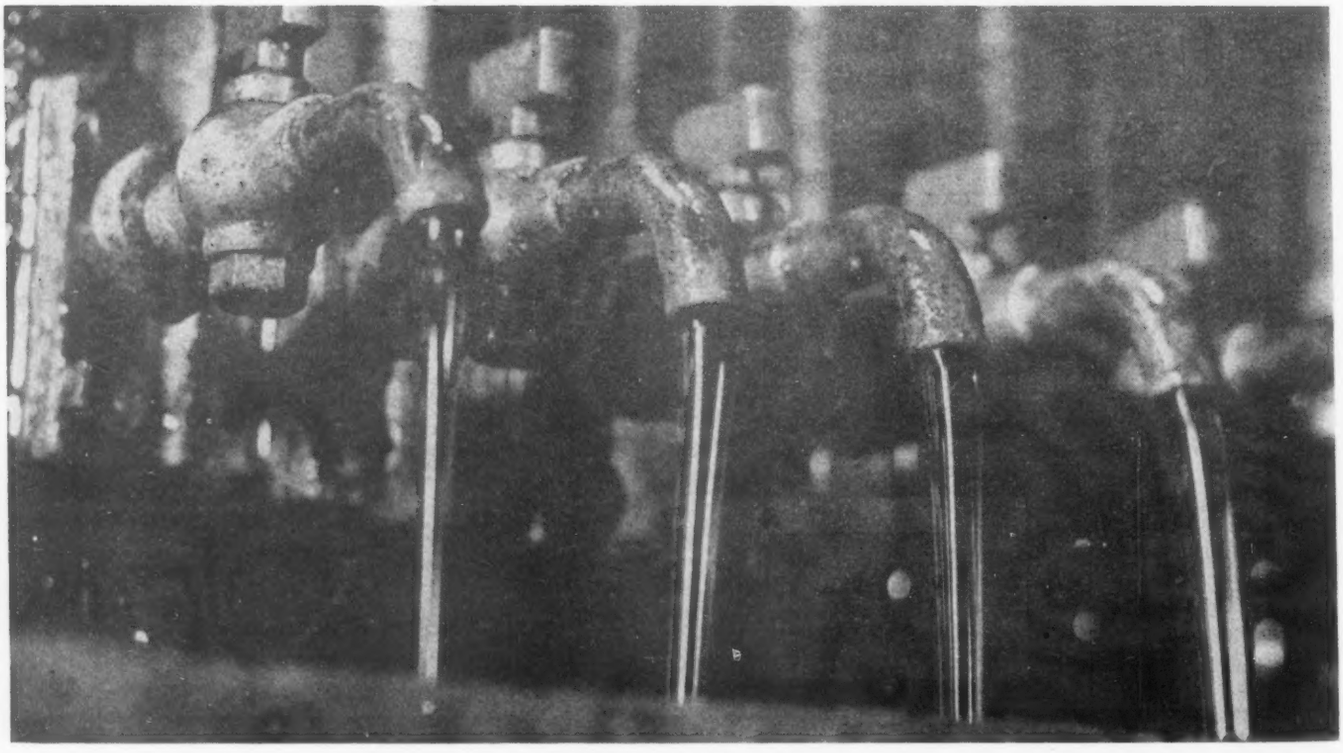
Neutral Alkyl Phosphates

Numerous investigations of the preparation of the tertiary alkyl o-phosphates have been carried out on the reaction between an alcohol and phosphorus oxychloride:

$$3ROH + POCl_3 \rightarrow R_3PO_4 + 3HCl$$

With phenols this reaction proceeds readily to completion without side reactions upon heating, but this is not the case with the alcohols due to the ease with which alkyl chlorides are formed. Various methods using low or moderate temperatures have been proposed to facilitate removal of the hydrochloric acid. For example, it may be eliminated by neutralizing with pyridine (27, 36, 50, 51), anhydrous ammonia (45), or other alkalis (28, 68); by employing reduced pressure (37, 48, 49), or by blowing with inert gases (28, 69). Catalysts will hasten its formation and subsequent removal (69). An alternative method involves reacting sodium alkoxides (24, 28, 43) and aluminum alkoxides (3) with phosphorus oxychloride to form metallic chloride and the desired ester.

This striking photograph shows the action of filtering alkyl acid phophates.



The neutral esters of pyrophosphoric, polyphosphoric, and metaphosphoric acids represent an interesting class of compounds recently investigated in our laboratories which differ considerably in physical and chemical properties from the ortho esters. Aside from ethyl metaphosphate, which can be made by the reaction of ethyl ether with phosphoric anhydride, the classical method for their preparation has been by the reaction of a silver salt of the phosphate with an alkyl halide:

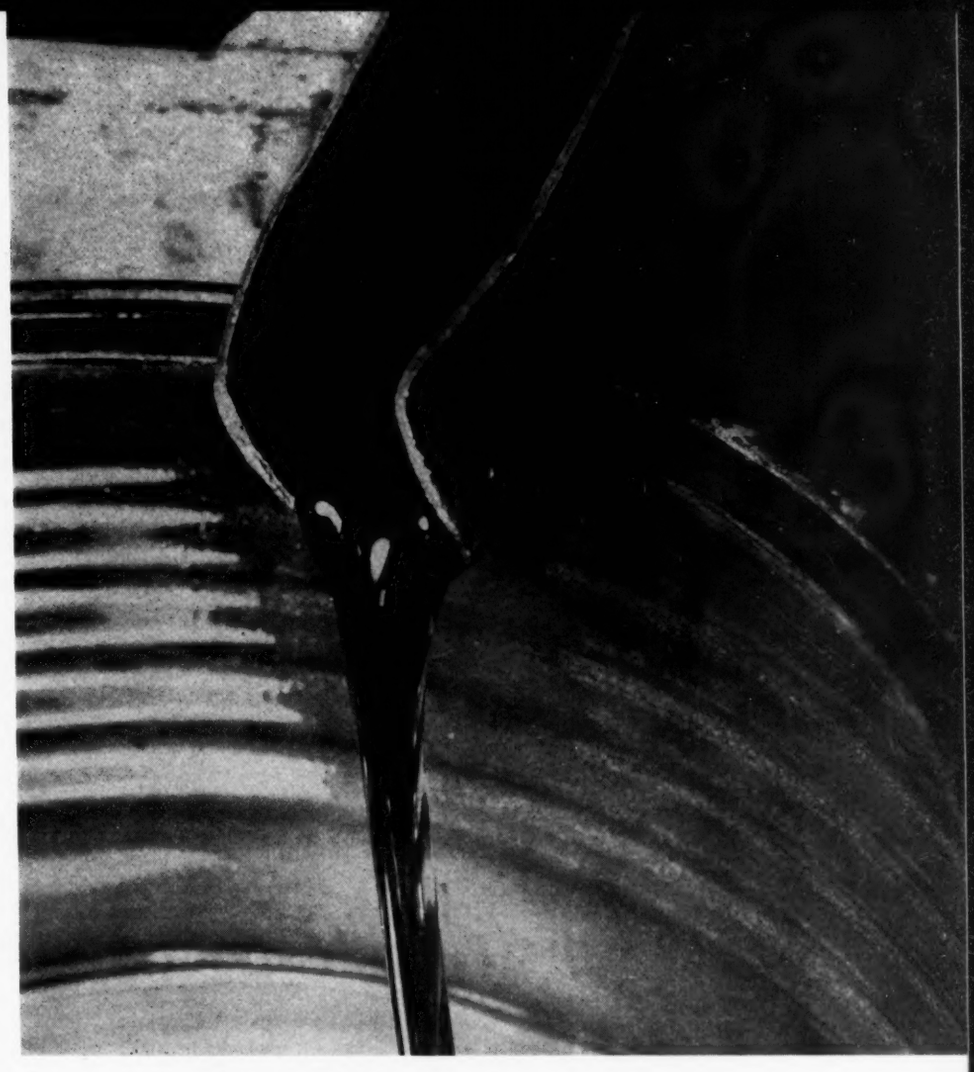
$$Ag_4P_2O_7 + 4RI \rightarrow R_4P_2O_7 + 4AgI$$
$$AgPO_3 + RI \rightarrow RPO_3 + AgI$$

A suitable method for the preparation of the higher phosphate alkyl esters consists of the addition of phosphoric anhydride to trialkyl o-phosphates as demonstrated in the following equations, in which the degree of dehydration of the resulting esters depends upon the proportions of reactants taken:

$$4R_3PO_4 + P_2O_5 \rightarrow 3R_4P_2O_7 \text{ (pyro)}$$
$$5R_3PO_4 + 2P_2O_5 \rightarrow 3R_5P_3O_{10} \text{ (tripoly)}$$
$$2R_3PO_4 + P_2O_5 \rightarrow R_6P_4O_{13} \text{ (tetrapoly)}$$
$$R_3PO_4 + P_2O_5 \rightarrow 3RPO_3 \text{ (meta)}$$

This method has been found applicable from methyl to the long chain esters, and is limited only by the thermal stability of the products.

In Table I are presented the specific gravities, boiling points, and refractive



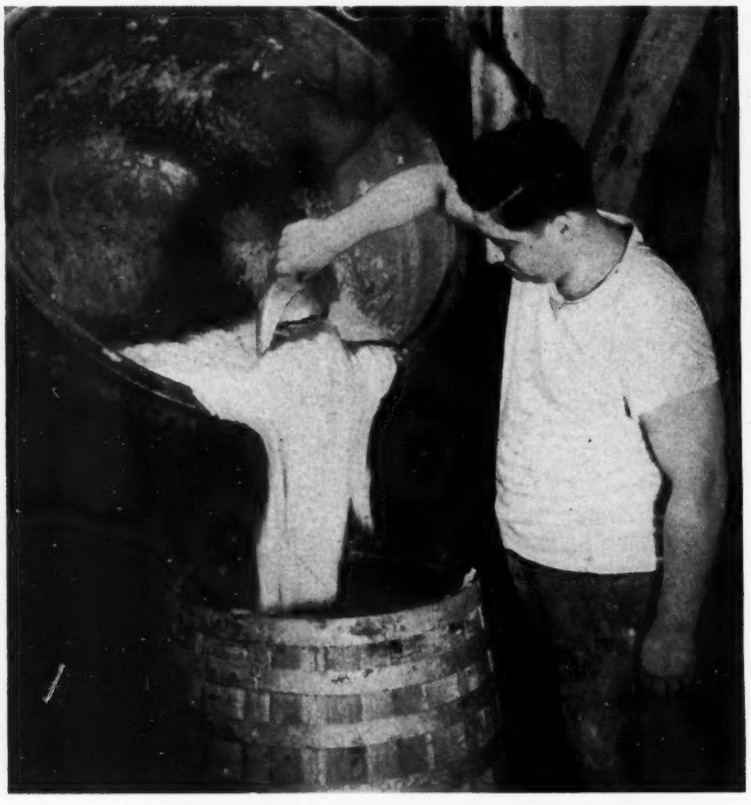
Alkyl acid phosphates ready for shipment.

TABLE I

Properties of Neutral Alkyl Phosphates

COMPOUND	Mol. Wt.	Sp. Gr. at x°/4° C.	B. P. ° C.	Ref. Index N^D	SOLUBILITY* Water	Alcohol	Acetone	Ether	Toluene	CCl_4	Naphtha
Orthophosphates, R_3PO_4											
Trimethyl phosphate	140	1.2052(25)	196	1.3950							
Triethyl phosphate	182	1.0637(25)	215	1.4039							
Tri n-propyl phosphate	224	1.0023(25)	252	1.4136							
Tri n-butyl phosphate	266	0.9727(25)	289	1.4203							
Tri i-butyl phosphate	266	0.9617(25)	264	1.4173							
Tri n-amyl phosphate	308	0.9497(25)	225(50 mm.)	1.4283							
Trimethallyl phosphate	263	0.988 (26)	135 (5 mm.)	1.445							
Trioctyl phosphate	434	0.921 (25)	Decomp.	1.442	I	S	S	S	S	S	S
Tricapryl phosphate	434	0.907 (25)	Decomp.	1.437	I	S	S	S	S	S	S
Pyrophosphates, $R_4P_2O_7$											
Tetramethyl pyrophosphate	234	1.357 (25)	Decomp.	1.410	SR	SR	S	SS	PS	I	I
Tetraethyl pyrophosphate	290	1.200 (25)	Decomp.	1.417	SR	SR	S	S	S	S	I
Tetrabutyl pyrophosphate	402	1.050 (25)	Decomp.	1.429	R	SR	S	S	S	S	S
Tetraoctyl pyrophosphate	626	0.977 (25)	Decomp.	1.443	R	SR	S	S	S	S	S
Tripolyphosphates, $R_5P_3O_{10}$											
Pentamethyl tripolyphosphate	328	1.430 (25)	Decomp.	1.420	SR	SR	S	I	I	I	I
Pentaethyl tripolyphosphate	398	1.245 (25)	Decomp.	1.424	SR	SR	S	I	SS	SS	I
Pentabutyl tripolyphosphate	538	1.095 (25)	Decomp.	1.435	I	SR	S	S	S	S	S
Tetrapolyphosphates, $R_6P_4O_{13}$											
Hexamethyl tetrapolyphosphate	422	1.474 (25)	Decomp.	1.423	SR	SR	S	I	SS	I	I
Hexaethyl tetrapolyphosphate	506	1.280 (25)	Decomp.	1.425	SR	SR	S	SS	S	S	I
Hexabutyl tetrapolyphosphate	674	1.119 (25)	Decomp.	1.435	R	SR	S	S	S	S	S
Hexaoctyl tetrapolyphosphate	1010	1.053 (25)	Decomp.	1.447	R	SR	S	S	S	S	S
Metaphosphates, RPO_3											
Methyl metaphosphate	94	1.620 (25)	Decomp.	1.439	SR	SR	S	I	I	I	I
Ethyl metaphosphate	108	1.420 (25)	Decomp.	1.438	SR	SR	S	I	SS	SS	I
Butyl metaphosphate (unstable)	136	1.227 (25)	Decomp.	1.445	SR	SR	S	S	S	S	I
Octyl metaphosphate (unstable)	192	1.151 (25)	Decomp.	1.450	SR	SR	S	S	S	S	S

* S = Soluble, PS = Partially soluble, SS = Sparingly soluble, I = Insoluble, R = Reacts, SR = Soluble and reacts.



Finished alkyl phosphate wetting agent.

indices of a number of neutral alkyl phosphates. This homologous series possesses a wide range of interesting properties which are primarily dependent upon the component organic and phosphate groups. Thus, the short chain esters are water-insoluble and volatile, while the long chain esters are water-insoluble and generally non-distillable. The ortho esters are not very reactive, while the pyro, poly, and meta esters readily condense with water, alcohols, amines, or other compounds containing a labile hydrogen. It is apparent that a combination of the proper alkyl and phosphate groups will give compounds which possess, within limits, any desired property, or furnish specific intermediates for phosphorylating reactions.

The well-known plasticizing behavior of the aryl phosphates obtains also in the alkyl series, notably tributyl phosphate as a plasticizer in cellulose acetate (60), in organic acid derivatives of cellulose (59), and in synthetic resins of the phenol-aldehyde type (71). Similarly, the alkyl phosphates have been used in lacquers (65) and in waterproofing textiles with cellulose acetate (1).

The use of the alkyl phosphates as alkylating agents has received investigation. Thus, ethyl, n-butyl, sec-butyl, and n-amyl o-phosphates yielded phenol ethers with phenol (50), and ethyl, i-propyl, and butyl o-phosphates alkylated benzene in a Friedel-Crafts reaction (5).

Several interesting applications of the alkyl phosphates as catalysts have been proposed. The trimethyl, triethyl, and other triesters are excellent accelerators for curing urea-formaldehyde resins, using 0.15 to 3.0% in the uncured mix (70). They have been shown to act as polymerizing agents for unsaturated hydrocarbons, drying oils, resins (12), and as catalysts in the manufacture of organic esters (20). Triethyl phosphate has been proposed (29) for use in the gas phase to catalyze the dehydration of glycols and olefinic alcohols to diolefins such as butadiene.

Other Proposed Uses

Among the further miscellaneous uses which have been proposed for the alkyl phosphates are their use as transformer oils (14), as absorbing fluids in refrigerating systems (18), as leveling liquids in printing compositions for vat dyestuffs (63), and as antifoaming agents (8). Mixtures of styrene and allyl and methallyl phosphates can be polymerized to form resins (7). Alkyl phosphates incorporated in the propellant powder will reduce corrosion to gun barrels (35, 55). Bearings of meters and compressors can be lubricated as well as protected from corrosion by trialkyl phosphates (13).

Since the neutral alkyl pyro, poly, and metaphosphates have not hitherto been available, the commercial application of the neutral esters has been limited to the ortho phosphates, a situation which it is hoped will be changed by investigations now under way.

Acid Phosphate Esters

The preparation of the alkyl acid o-phosphates is accomplished by several well-known procedures. The classical methods involve the partial esterification of phosphorus oxychloride in which one or two chlorides are substituted with subsequent hydrolysis to give the desired acid ester. This method has its limitations, inasmuch as the yields are poor due to the formation of the mixtures of primary, secondary, and tertiary esters.

Of greater recent commercial interest are the products obtained by reacting alcohols with definite proportions of phosphoric anhydride. A mixture of mono- and dialkyl acid phosphates can be formed when three mols of alcohol are reacted

Semi-works filter press for clarifying solutions of alkyl phosphate salts.

with one mol of phosphoric anhydride (30, 33):

$$3ROH + P_2O_5 \rightarrow RH_2PO_4 + R_2HPO_4$$

It is possible to prepare products which consist substantially of primary ortho acid esters by hydrating a higher ester. For example, ethyl metaphosphate (52) will react with water to give alkyl acid o-phosphates, and pyrophosphate esters can likewise be hydrated:

$$R_2H_2P_2O_7 + H_2O \rightarrow 2RH_2PO_4$$

Reaction of a more dehydrated phosphoric acid with an alcohol has been considered to give an ester lower than the acid used (67). With pyrophosphoric acid the reaction is:

$$H_4P_2O_7 + ROH \rightarrow RH_2PO_4 + H_3PO_4$$

Although claims have been made for the production of the esters of the more dehydrated acids by esterification of a higher phosphoric acid with an alcohol,

$$H_4P_2O_7 + 2ROH \rightarrow [R_2H_2P_2O_7 + H_2O] \rightarrow 2RH_2PO_4$$

there is some doubt as to the identity of the products because the water formed in the reaction hydrates the ester. Thus reactions of the acids and alcohols to give pyrophosphate (9), tetraphosphate (38), and metaphosphate esters (42), would as indicated by the equation, normally to be expected to give lower alkyl phosphoric acids.

Despite the strong dehydrating action of phosphoric anhydride it is possible under carefully controlled conditions to make esters of the higher phosphoric acids by condensing it with an alcohol using a ratio of alcohol to anhydride less than 3 to 1.

$$2ROH + P_2O_5 \rightarrow R_2H_2P_2O_7 \text{ (pyro)}$$
$$5ROH + 3P_2O_5 \rightarrow R_5H_5(P_2O_{10})_2 \text{ (tripoly)}$$
$$3ROH + 2P_2O_5 \rightarrow R_3H_3P_4O_{13} \text{ (tetrapoly)}$$
$$ROH + P_2O_5 \rightarrow RH(PO_3)_2 \text{ (meta)}$$

As illustrated by the above equations, this process yields products in which the ratio of alkyl groups to acidic hydrogen is always 1 to 1. The products are probably not entirely homogeneous, and contain minor amounts of higher and lower esters as well as free phosphoric acid.

Table II contains data which have been compiled on commercial grade samples of the ortho, pyro, and poly-acid phos-

TABLE II

Properties of Alkyl Phosphoric Acids

COMPOUND	Mol. Wt.	Sp. Gr. at x°/4° C.	Ref. Index N_D	Decomp. Point ° C.	SOLUBILITY* Water	Alcohol	Acetone	Ether	Toluene	CCl_4	Naphtha
Orthophosphates											
R_2HPO_4											
Dimethyl acid o-phosphate	126	1.335 (25)	1.408	172-76	S	S	S	I	I	I	S
Diethyl acid o-phosphate	154	1.186 (25)	1.417	>175	S	S	S	S	S	PS	S
Ethyl i-amyl acid o-phosphate	196	1.071 (25)	1.421	>175	I	S	S	S	S	S	SS
Ethyl octyl acid o-phosphate	238	1.028 (25)	1.433	>175	I	S	S	S	S	S	S
Ethyl capryl acid o-phosphate	238	1.016 (30)	1.430	167-71	I	S	S	S	S	S	S
Dibutyl acid o-phosphate	210	1.057 (25)	1.428	>175	I	S	S	S	S	S	S
Butyl amyl acid o-phosphate	224	1.037 (25)	1.428	>175	PS	S	S	S	S	S	S
RH_2PO_4											
Monomethyl acid o-phosphate	112	1.511 (25)	1.420	169-73	S	S	S	SS	I	I	S
Monoethyl acid o-phosphate	126	1.430 (25)	1.427	165-70	S	S	S	S	I	I	S
Mono i-propyl acid o-phosphate	140	1.291 (30)	1.426	74-80	S	S	S	S	I	I	SS
Mono n-propyl acid o-phosphate	140	1.331 (30)	1.427	122-28	S	S	S	S	I	I	I
Mono n-butyl acid o-phosphate	154	1.18 (25)	1.429	105-10	S	S	S	S	S	SS	SS
Mono i-amyl acid o-phosphate	168	1.142 (25)	1.432	160-70	I	S	S	S	S	S	SS
Mono octyl acid o-phosphate	210	1.066 (25)	1.444	170-75	I	S	S	S	S	S	S
Mono capryl acid o-phosphate	210	1.092 (25)	1.437	100-10	I	S	S	S	S	S	S
Pyrophosphates											
$R_2H_2P_2O_7$											
Dimethyl acid pyrophosphate	206	1.562 (25)	1.425	197-200	SR	SR	SS	I	I	I	I
Diethyl acid pyrophosphate	234	1.507 (25)	1.437	141-46	SR	SR	S	I	I	I	I
Di i-propyl acid pyrophosphate	262	1.351 (25)	1.433	75-80	SR	SR	S	S	I	I	I
Di n-propyl acid pyrophosphate	262	1.374 (25)	1.441	96-100	SR	SR	S	SS	I	I	I
Di n-butyl acid pyrophosphate	290	1.228 (25)	1.431	165-69	SR	SR	S	S	S	I	I
Di i-amyl acid pyrophosphate	318	1.149 (25)	1.432	164-68	R	SR	S	S	S	S	I
Dioctyl acid pyrophosphate	402	1.094 (25)	1.448	151-53	R	SR	S	S	S	S	S
Dicapryl acid pyrophosphate	402	1.098 (25)	1.442	98-103	R	SR	S	S	S	S	S
Tripolyphosphates											
$R_5H_5P_6O_{20}$											
Pentamethyl acid tripolyphosphate	586	1.64 (25)	1.435	>175	SR	SR	S	I	I	I	I
Pentaethyl acid tripolyphosphate	656	1.50 (25)	1.436	109-14	SR	SR	S	I	I	I	I
**Penta i-propyl acid tripolyphosphate	726	1.405 (25)	1.439	58-63	SR	SR	S	SS	I	I	I
Penta n-butyl acid tripolyphosphate	796	1.309 (25)	1.442	115-20	SR	SR	S	S	PS	I	I
Penta i-amyl acid tripolyphosphate	866	1.233 (25)	1.438	123-28	SS	SR	S	S	S	S	SS
Penta octyl acid tripolyphosphate	1076	1.123 (30)	1.450	125-30	R	SR	S	S	S	S	S
**Penta capryl acid tripolyphosphate	1076	1.125 (25)	1.445	73-78	R	SR	S	S	PS	S	SS
Tetrapolyphosphates											
$R_3H_3P_4O_{13}$											
Trimethyl acid tetrapolyphosphate	380	1.694 (25)	1.440	>175	SR	SR	PS	I	I	I	I
Triethyl acid tetrapolyphosphate	422	1.558 (25)	1.436	138-43	SR	SR	PS	I	I	I	I
**Tri i-propyl acid tetrapolyphosphate	464	1.455 (30)	1.440	55-60	SR	SR	S	I	I	I	I
Tri n-butyl acid tetrapolyphosphate	506	1.320 (30)	1.435	135-40	SR	SR	S	S	PS	SS	I
Tri i-amyl acid tetrapolyphosphate	548	1.31 (25)	1.442	114-20	SR	SR	S	S	I	I	I
Tri octyl acid tetrapolyphosphate	674	1.164 (25)	1.444	117-20	SR	SR	S	S	S	S	S
**Tricapryl acid tetrapolyphosphate	674	1.187 (25)	1.448	65-70	SR	SR	S	SS	SS	S	SS

* S = Soluble, PS = Partially soluble, SS = Sparingly soluble, I = Insoluble, R = Reacts, SR = Soluble and reacts.
** Unstable.

phate esters. Examination of the properties of the acid esters shows them to be similar to the neutral esters in their many possible combinations, indicating a wide range of potential applicability.

Several varied uses for the acid esters have already been developed. They are effective catalysts for the hardening of urea-formaldehyde resins, for by the use of these acidic accelerators, not only can baking schedules be shortened and the baking temperature lowered, but also air-drying can be effected. They are also of value in hardening urea-phenol-formaldehyde resins, and may be used with melamine-formaldehyde-butanol resins where package stability is not a major factor (34).

The rustproofing action of phosphoric acid is well known, and it is not surprising that the alkyl phosphoric acids show considerable promise as anti-corrosive agents. In this connection they may be used alone, dissolved in oils (53), or in solvents (58, 64). In lubricants the corrosion of alloy bearings by lubricating oil is reduced by the addition of organic esters of phosphoric acid (4), while lubricants which will not break down under high bearing pressures, the so-called extreme pressure type, are obtained by adding a small amount of an aliphatic alkyl phosphate (19). Certain alkyl phosphates have been used as varnish inhibitors for lubricating oils (46).

Alkyl acid phosphates are useful as soldering fluxes (54), because no obnoxious fumes are given off when the work is carried out in a confined space, and in addition, spattering is reduced and corrosive residues eliminated. Good results were obtained in welding zinc, magnesium, and aluminum. Water-soluble reaction products of a dehydrated phosphoric acid and a primary alcohol have been found to be good metal cleaners, combining grease-solvent power with rust inhibition (67).

Other uses which should be briefly mentioned are the tanning action of certain esters (42), the reduction of gelatinization of hides with diethyl o-phosphate (56), and the incorporation of polyphosphoric (40), tetraphosphoric (39), and metaphosphoric (41) acid reaction products in non-shortening cake mixes and egg materials.

Salts of Alkyl Acid Phosphates

Although it is possible to form salts of the primary and secondary phosphates by heating a trialkyl phosphate with a strong base, it is preferable to neutralize the free hydroxyl groups on the acid esters. Thus, the hydrogen may be replaced by various metals, the alkalis, the alkaline earth metals, ammonia, or the organic amines. Care must be taken with the higher acid esters that hydration does not attend neutralization. This can be prevented entirely by the use of non-aqueous bases such as the amines and anhydrous ammonia.

Table III contains data on several salts of technical grade which have been under investigation in our laboratories. For the most part they are associated with water, either in the form of concentrated liquids or as pastes of pH 7.0 to 7.5. In many instances it is entirely feasible to remove the water if an anhydrous salt is desired.

The surface active nature of the soluble salts of the longer chain alkyl phosphates has been recognized. The product of pyrophosphoric acid and a higher hydroxy hydrocarbon is used as a washing and cleaning composition (11) in which a peroxide may also be combined (10). When polymeric metaphosphoric acid is reacted with an aliphatic hydroxy compound, salts of the product may be used as auxiliaries in wool-dyeing and leather-greasing (6).

The sodium salts of octyl and capryl tripolyphosphates are strong wetting agents. They are substantially neutral in reaction when dissolved in distilled water,

TABLE III

Properties of Alkyl Phosphoric Acid Salts

COMPOUND	% Concentration	Sp. Gr. at x°/4° C.	Ref. Index N^D
Orthophosphates			
R_2MPO_4			
Diethyl sodium o-phosphate	78	1.258 (25)	1.409
Ethyl octyl sodium o-phosphate	82	1.119 (30)	1.431
Ethyl octyl potassium o-phosphate	77	1.147 (25)	1.425
Ethyl octyl ammonium o-phosphate	84	1.044 (25)	1.434
Ethyl capryl sodium o-phosphate	84	1.069 (75)	1.438
Dibutyl ammonium o-phosphate	88	1.032 (25)	1.425
RM_2PO_4			
Monomethyl ammonium o-phosphate	54	1.246 (30)	1.409
Monomethyl sodium o-phosphate	66	1.53 (30) appar.	....
Monomethyl calcium o-phosphate	100	2.50 (30)	1.532
Monoethyl ammonium o-phosphate	55	1.240 (30)	1.415
Monoethyl sodium o-phosphate	66	1.472 (30)	1.423
Monoethyl calcium o-phosphate	100	1.917 (30)	1.532
Mono i-propyl ammonium o-phosphate	62	1.196 (30)	1.415
Mono i-propyl sodium o-phosphate	60	1.320 (30) app.	1.420
Mono i-propyl calcium o-phosphate	100	1.928 (25)	1.480
Mono n-propyl calcium o-phosphate	100	1.774 (25)	1.50
Mono n-butyl ammonium o-phosphate	60	1.17 (25)	1.426
Mono n-butyl sodium o-phosphate	71	0.889 (25) app.	1.426
Mono n-butyl calcium o-phosphate	100	....	1.478
Mono i-amyl ammonium o-phosphate	77	1.14 (25) app.	1.432
Mono i-amyl sodium o-phosphate	73	1.24 (30) app.	....
Mono i-amyl potassium o-phosphate	66	1.30 (30)	1.425
Mono i-amyl triethanolamine o-phosphate	100	1.213 (25)	1.491
Pyrophosphates			
$R_2M_2P_2O_7$			
Dimethyl sodium pyrophosphate	65	1.4 (30) app.	....
Diethyl ammonium pyrophosphate	70	1.305 (25)	1.434
Dibutyl ammonium pyrophosphate	64	1.183 (25)	1.422
Di i-amyl ammonium pyrophosphate	72	1.143 (25)	1.430
Di i-amyl sodium pyrophosphate	74	1.2 (25) app.	....
Di i-amyl potassium pyrophosphate	60	1.262 (25)	1.412
Dicapryl triethanolamine pyrophosphate	100	1.170 (25)	1.483
Tripolyphosphates			
$R_5M_3P_4O_{30}$			
Pentaethyl ammonium tripolyphosphate	72	1.317 (25)	1.434
Pentaethyl potassium tripolyphosphate	55	1.390 (30)	1.402
Penta i-amyl ammonium tripolyphosphate	77	1.187 (25)	1.436
Penta i-amyl sodium tripolyphosphate	71	1.17 (25) app.	....
Penta i-amyl potassium tripolyphosphate	68	1.323 (25)	1.420
Penta octyl sodium tripolyphosphate	70	1.17 (25) app.	1.435
Penta octyl potassium tripolyphosphate	71	1.208 (25) app.	1.434
Penta capryl sodium tripolyphosphate	70	1.19 (25)	1.437
Penta capryl potassium tripolyphosphate	77	1.175 (25) app.	1.435
Tetrapolyphosphates			
$R_5M_3P_4O_{13}$			
Triethyl ammonium tetrapolyphosphate	70	1.345 (30)	1.437
Triethyl potassium tetrapolyphosphate	61	1.486 (30)	1.415
Tri i-amyl ammonium tetrapolyphosphate	63	1.228 (30)	1.439
Trioctyl sodium tetrapolyphosphate	63	1.19 (25) app.	1.433
Trioctyl potassium tetrapolyphosphate	70	1.20 (30) app.	1.432
Tricapryl sodium tetrapolyphosphate	62	1.26 (25)	1.430
Tricapryl potassium tetrapolyphosphate	58	1.262 (30)	1.414

New research laboratories of Victor Chemical Works.

and are marketed in the form of pastes containing 70% of active material. The outstanding characteristic of these wetting agents is their effect on the surface tension of water. In Table IV the surface tension in dynes/centimeter is shown for different concentrations of the two salts. The remarkably low values obtained are

TABLE IV
Lowering of Surface Tension

% Concentration (70% Paste)	Penta octyl sodium tripolyphosphate (dynes/cm. corr.)	Penta capryl sodium tripolyphosphate (dynes/cm. corr.)
Distilled H_2O	71.6	71.6
0.0045	35.9	32.0
0.09	31.2	26.7
0.18	27.9	24.0
0.36	25.8	23.0
0.71	24.6	...
1.43	24.8	...
2.85	24.5	22.8

evidence of the high surface active nature of these compounds. Their wetting-out property on the anhydrous basis by the Draves test (1.5 gm. sinker; 5 gm. skein) showed a sinking time of 13 seconds for the octyl salt and 11 seconds for the capryl salt at 0.2% concentration. Both have little tendency to produce foaming solutions.

The ammonium salts of the alkyl phosphates are competent flameproofing compounds which do not affect the feel of textiles and paper. It has been found that ease of absorption and also degree of fireproofing are dependent to a certain extent upon the type of material being treated. Since the inorganic ammonium phosphates are the cheapest, most effective known fireproofing agents of the phosphate type, it is often preferable to use mixtures of them and alkyl ammonium phosphates. The latter compounds impart a softening effect and markedly modify the crystallizing characteristics of the inorganic salts.

The ammonium salts of the esters in the polyphosphate as well as pyrophosphate series are also good fireproofing agents when applied either alone or in admixture with ammonium phosphates. Alkyl guanidine phosphates (57), salts of dimethyl phosphate (66), and alkyl ammonium orthophosphates (16, 33) have been investigated for flameproofing nitrocellulose films and cellulosic products.

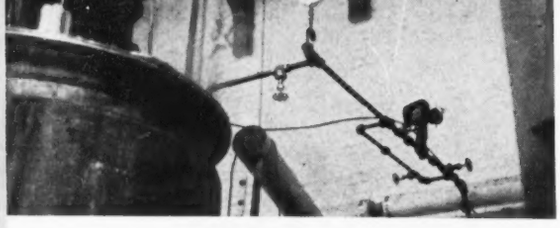
Additional applications of the salts of the orthophosphates include their use as lubricants in the spinning of wools (22, 33), as antifreeze liquids (32, 33), as suspending media for lap-grinding abrasives (31), and as stabilizers for concentrating latex (15). Ethyl mercury phosphate has been suggested as a preservative for cordage and canvas (17) and as an insecticide (21), while an ethyl mercury phosphate-borax composition (26) is used for control of blue-staining fungi on lumber. Strontium and magnesium salts of long chain alkyl phosphoric acids when incorporated in mineral lubricating oils inhibit deterioration of the oil (25, 47). Other salts have been proposed for use in Diesel lubricants (44). Calcium salts of the lower aliphatic esters have been suggested as fertilizers which would not become insoluble by reaction with the soil (61, 62), and the calcium and magnesium salts of the lower dialkyl and monoalkyl phosphates have been patented as fertilizers and components of fertilizer compositions (2).

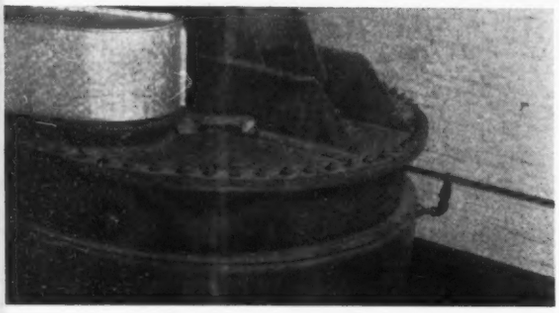
Large scale production of phosphoric anhydride, dehydrated phosphoric acids, and the phosphorus chlorides has made possible the inexpensive manufacture of many organic phosphorus compounds, notably the alkyl phosphates. As indicated by this article, some applications in industry for these compounds have already been found, and new, important uses can be expected to appear in increasing numbers.

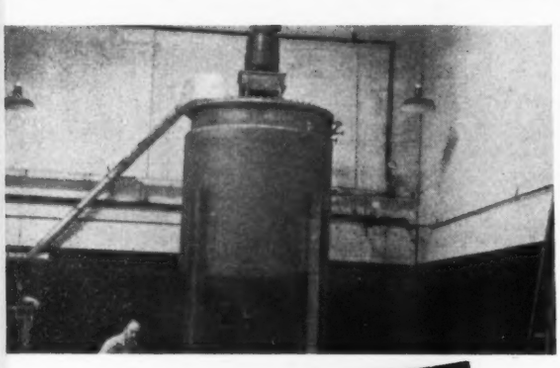
(Literature cited will be found on page 557)

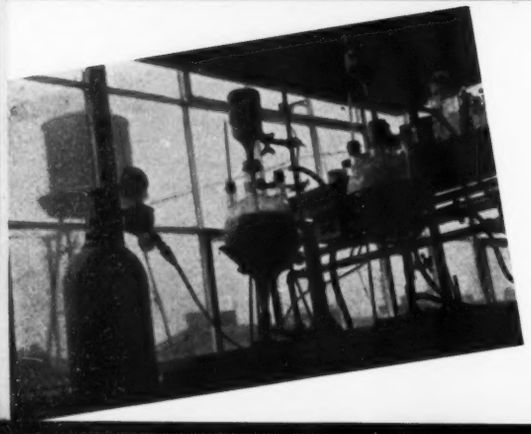
Polyhydric Alcohol Esters IN OUR WAR EFFORT

By Jack W. Daum, *Glyco Products Co.*









OUR country at war demands of industry that it investigate all materials that may speed our war effort, so that victory may be ours the sooner. Chemistry is playing a role of ever increasing importance in this search. It is supplying replacements for non-available essential materials, improving and supplementing existing sources and developing new materials and usages. Among these newer materials is a group of chemicals of exceptional interest at this time—the polyhydric alcohol esters of high molecular weight fatty acids. Although fairly recent in origin, in the span of a decade, they have proven their versatility, not only by improving existing processes, but by development of entirely new techniques.

Metals

In this race for increased production of war materials, metals play a vital role. Plant output is often dependent solely on the speed of metal fabrication. Consider how much time has been lost by the metal working industry in the stamping and drawing of nickel alloys because of the necessity of thoroughly cleaning parts before annealing, lest they be contaminated by sulfur or other residue left by the drawing lubricant. The necessity of cleaning can be avoided by employing diglycol stearate (the stearic acid ester of diethylene glycol), a wax-like solid, with a melting point of 51-54°C., dispersible in hot water. Diglycol stearate dispersions will fire off completely without residue at any annealing temperature (400°F. minimum), in an atmosphere of either oxygen or hydrogen, and will not recondense on the annealed parts. This not only effects a speed-up in production, but eliminates the chlorinated solvents used for degreasing, which are critical materials, essential to our war effort.

Diglycol stearate dispersions of one to two per cent concentration are also used as lubricants in tin stamping and drawing. It permits stamping of lacquered metal surfaces without fracturing the coating. In higher concentrations, it is an interesting lubricating compound for drawing aluminum, particularly collapsible tubes from blanks. Diglycol laurate, the analogous lauric acid ester, a pale, oily liquid, is being used to advantage in drawing and stamping up to 0.02 gauge brass and alloys of similar hardness.

Another bottle-neck in this field is the application of protective coatings. For aluminum castings, hot paraffin applied by dipping or spraying has been used. Cost of maintaining high temperature plus continuous fire hazard from the molten bath, has made this technique undesirable. A solution to this problem which eliminates both the fire hazard and temperature control, presents itself as an emulsion of: 1 part diglycol stearate, 2 parts microcrystalline paraffin, 4 parts paraffin wax and 40 parts of water. A complete discussion of this method is given in *Metal Progress,* September, 1940; title "Protective Coatings Sprayed on Aluminum Castings" by R. M. Major. The emulsion is sprayed in the cold by a pressure gun, and offers excellent protection against corrosion, particularly where such parts are to be used at temperatures causing condensation of liquid water or at temperatures below 32°F., with frequent cycles of condensation with subsequent freezing of frost or ice, and then defrosting.

This emulsion is also of importance in eliminating the hot lanolin-solvent bath technique for the protection of ferrous metals. It speeds application of protective coatings to large machinery; hand application is replaced by the pressure spray gun, which places the protective coating on otherwise inaccessible areas.

Synthetic and Natural Rubber

Synthetic and natural rubbers are among the most critical of our essential materials. All of us, through newspaper headlines and other mediums, are familiar with the necessity of speeding up the production and processing of these elastomers. Expediting the solution of this industry's many problems is of prime importance to our war needs. A basic problem in the synthetic rubber field is the plasticizing of synthetic rubbers of the butadiene type. It has been found that the ricinoleic acid ester of glycerine is very effective in replacing dibutyl phthalate and similar plasticizers. This ester, when incorporated into the raw stock in amounts of five to ten per cent gives a flexibility to the cured stock equally as good as 20 to 30 per cent dibuytl phthalate and does not exude. Furthermore, in these amounts, it exhibits good lubricating characteristics, facilitating release from the curing molds. As this ester is insoluble in mineral and vegetable

Left, equipment used in manufacture of polyhydric alcohol esters

The polyhydric alcohol esters have many diversified uses in many industries. A few are discussed here.

oils, it gives added resistance to greases and oils when the synthetic rubber is used for hose, gaskets, packings, etc. Its freezing point of —50° C. is of interest for low temperature work. It has a definite wetting-out action on pigments, enabling them to be readily milled into the stock, giving easier and quicker grinding as well as more uniform dispersion throughout the rubber. In adding to the synthetic rubber, it is advisable to add slowly in small portions, allowing each portion to be digested by the stock on the mill before the next portion is added. This eliminates any possibility of slip on the mill. Stocks stand up well on elongation tests. The problem of sun-checking in the butadiene rubbers can be eliminated by the addition of small amounts of glyceryl monostearate to the basic formulation.

The natural rubber industry has always been confronted by the problem of stacking raw rubber sheets, without their adhering to each other. In the past, the difficulty has been partially overcome by dusting with talc as the sheets come from the calendering operations. Unfortunately, on reworking the rubber for molding and curing, the talc can not be absorbed by the rubber stock, and as a result pin holes and other imperfections appear. The use of a one to two per cent diglycol stearate dispersion in water, applied to the stock either by spraying or cold bath, eliminates this adhesion. There is no deleterious effect on the stock since the diglycol stearate is completely absorbed by the rubber during vulcanization. This dispersion can also be used as a lubricant for cutting raw rubber gaskets.

Another contribution in the rubber field is a stabilizer and dispersing agent for latex. Since latex dispersions are readily upset by variations in pH, glyceryl monostearate, with a pH of 9.3-9.7 is suggested as the "tool." A one-half to one per cent dispersion in water is sufficient to suspend 300 times its own weight of whiting. This dispersion can be added to the latex with simple stirring and will maintain the pigment in a homogenous suspension throughout the latex. Increased stability of the latex emulsion is in evidence. No foaming is noticed on the addition, such as might be obtained from other types of dispersing agents.

Synthetic Resins

Because of the ever increasing needs of our war machine for rubber and similar critical materials, industry has come to depend on the synthetic resins for alleviation of the shortages caused by these ever growing demands. With this accelerated usage of synthetic resins in molding, extruding, sheeting and films, it is interesting to note the application of some of the polyhydric alcohol esters as plasticizers.

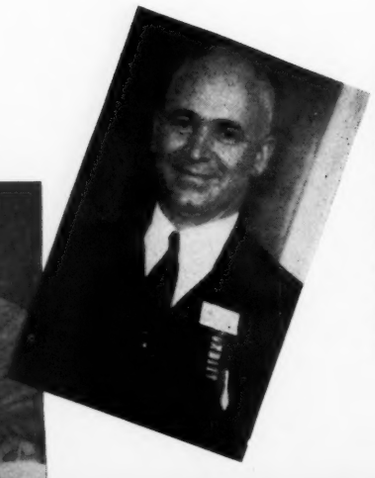
Diethylene glycol mono laurate, a pale, oily liquid, insoluble in water, is of prime importance as a nitro-cellulose plasticizer. It exhibits true solvent action on the resin and has a lower volatility than dibutyl phthalate. Films have excellent flexing characteristics, especially when compounded with other resins such as ester gum. Diethylene glycol mono laurate also exhibits good pigment dispersing and suspending characteristics. For processing the melamine-urea formaldehyde resins, diethylene glycol mono laurate is suggested in concentrations of 15 to 20 per cent. Hardness of the film is not effected, and its elastic characteristics are enhanced. In working the urea-formaldehyde resins for coating and casting, diglycol stearate and diglycol laurate are suggested as plasticizers. Ten per cent based on the resin replaces 25 to 30 per cent dibutyl phthalate with no "glazing" on cure. These esters eliminate the possibility of odor and taste transmission when used in resin films for food purposes. In ethyl cellulose formulations for molding, 30 per cent theop, a similar type of ester, exhibits no exuding, discoloration, or other deleterious characteristics, either initially or on extended aging tests. It is also of interest as a plasticizer for sheeting, extruding and films. It is completely compatible with ethyl cellulose and has excellent solvent action, dissolving the resin in the cold.

Textiles

The war has cut off many basic chemicals at their source, presenting additional difficulties in the manufacture of textiles. Lubricating, processing and finishing operations present problems which the polyhydric alcohol esters play an important role in solving. Of the many compounds in this grouping, diglycol stearate and diglycol laurate show unusual adaptability in satisfying this industry's specific needs. A 12 to 15 per cent solution of diglycol laurate in white mineral oil plus the addition of one per cent wetting agent produces a water-white solution which gives stable emulsions in water within wide limits. It is generally employed as an emulsion in the final bath or rinse for finishing. Among other interesting features is the fact that it will produce no changes in color or reduce the tensile strength of the fabric. It will not develop rancidity or odor. As a lubricant for spun rayon stock, worsted stock and for mercerizing, the diglycol laurate-white mineral oil solution is indicated, and will replace olive oil in many instances. The addition of about two to three per cent diglycol laurate to the regular mineral oil lubricants enables the more complete removal of the oil from the wool. The mineral oil residue has been brought down to 0.2 per cent without the use of strong alkali or excessive scouring. It is of considerable interest as a dye solvent which together with its complete solubility in mineral oil permits its combined use as a carrier of tints and as a solubilizer in rayon oils. The diglycol stearate is an excellent emulsifying agent for oils, solvents and waxes, where a stable neutral, viscous emulsion, containing no free alkali or amines is desired. It has the ability to act as a penetrant, driving waxes and oils into the interior of the threads, giving a fuller, more subtle hand, avoiding brittleness. Another in the list of diethylene glycol esters assuming appreciable importance in the processing field, is the water soluble glycol boriborate, known technically as aquaresin. It is a clear, liquid resin, with varying viscosities, depending on the organic content. Preliminary work with aquaresin as a lubricant for cotton fibres has been done at Alabama Polytechnic Institute under the direction of Charles B. Ordway, Associate Professor of Textile Chemistry and Dyeing. A paper on the results of this research was given at the Annual Convention of the Textile Section of the American Chemical Society in Chicago some time ago. The following paragraph is taken from Prof. Ordway's summary of his findings:

"First, it (aquaresin) tends to restore the dyed cotton fibres to their original waxy and resilient condition. Second, it possesses approximately the same hygroscopic properties that the original good character of raw cotton has; and third, it is non-corrosive to the metallic card clothing while the common salt washes that are usually run in connection with the mineral oil spray are rather corrosive and increase replacement costs noticeably in some plants. Fourth, if sprayed on, it would be best to use about a 25 per cent solution (water soluble) and it should assist in decreasing the "fly" and has fire retarding properties."

While only few fields have been discussed in this article, namely metals, rubber, synthetic resins and textiles, the polyhydric alcohol esters have very many diversified uses in other industries. Space does not permit a discussion of these various uses. However, a study of the properties of these esters will readily indicate their possibilities in other fields.



American Chemists Discuss War Program

By Walter J. Murphy
Editor, Chemical Industries

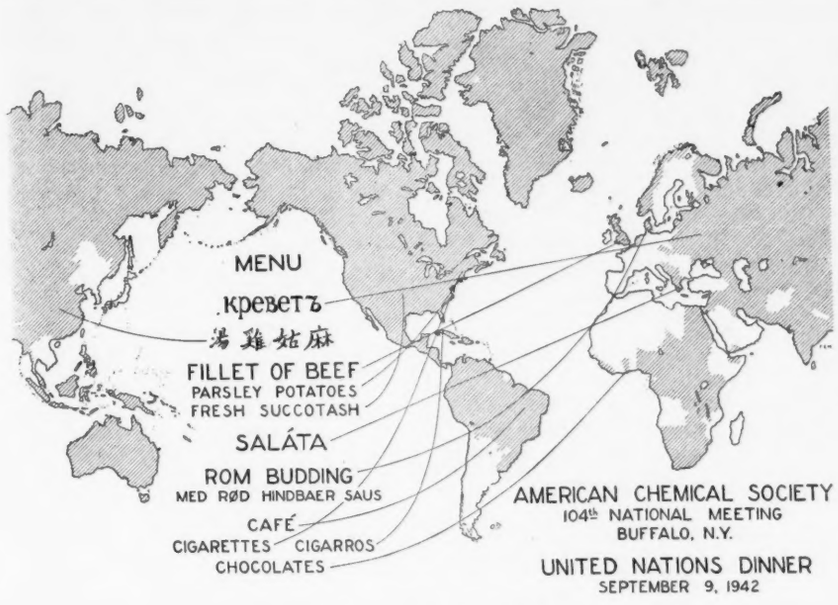
Despite the difficulties of transportation and housing under all-out war conditions, 4,228 chemists, engineers and chemical industrialists gathered at Buffalo last month at the 104th meeting of the American Chemical Society to discuss latest developments in chemical technology. Much of the actual progress made must remain "off-the-record" for the duration.

FOUR thousand two hundred and twenty-eight chemists, engineers and outstanding chemical executives gathered in Buffalo last month for the 104th meeting of the American Chemical Society unmindful of the trials and tribulations of traveling in a war period. Voluntary censorship took a terrific toll of the usual papers reporting America's latest scientific achievements, but the country's technologists huddled in corners reported off-the-record progress that promises nothing but bad news for the Axis.

Very significant was the meeting place

Above Harry N. Holmes, A. C. S. President; Dr. Willard H. Dow, President, Dow Chemical; and Dr. A. L. Elder, WPB. Left, President Holmes presenting the Garvan Medal to Miss Florence B. Seibert; Dr. Holmes also presenting Alpha Chi Sigma's check to J. L. Oncley; Dr. and Mrs. J. L. Oncley; Dr. Per K. Frolich, Standard Development and President-Elect of the Society; R. L. Murray, Hooker Electrochemical, Mrs. Harry N. Holmes, and Lieutenant General William S. Knudsen, speaker at the subscription dinner; Lawrence H. Flett, National Aniline and member of the local section's executive committee.

Do not miss Dr. C. M. A. Stine's amazing portrait of the future in this review. It's a worthwhile revelation.



Interesting menu was part of the United Nations Dinner

itself—the Buffalo-Niagara Falls area—America's great electrochemical development of several decades. Day and night the mighty chemical industry in that section is producing the sinews of all-out industrialized and chemicalized modern warfare. While chemists discussed their weighty problems the wheels of production spun on with ever-increasing momentum around the clock.

Outlook in Synthetic Rubber

The eyes of the Nation turned to Buffalo and the chemists assembled there for some encouraging signs on the country's chief production headache—synthetic rubber. What the chemists heard was optimistic in nature but very necessarily very general in scope.

Science will successfully meet the increasing demand for synthetic rubber and other vital war materials and substitutes, Dr. Harry N. Holmes, president of the Society, predicted at the public session which officially opened the meeting on Labor Day.

Dr. Holmes, in his presidential address, said it was "unfair" to call upon military men to make important decisions on scientific research problems.

"The weapons of World War II and the processes of essential war industry have become so scientific that it seems almost unfair to ask men trained in West Point, Annapolis, and other military institutions to make vital decisions on scientific research problems," Dr. Holmes said.

"Yet that is the system. Military men decide, with advice, no doubt, what war problems are worth investigation by our official scientific bodies. This is a bottle neck because there is no place in the curriculum of our great military institutes for research training. Perhaps research appreciation could be taught in the routine courses in chemistry and physics."

Brain power will win the war if given an opportunity to function, according to Dr. Holmes, who is chairman of the department of Chemistry at Oberlin College. He asserted that the war effort was being hampered by the drafting of chemists and graduate students who in a year or two would receive their research training.

Dr. Holmes urged the formation of a war and peace advisory council of 100 able scientists, economists, sociologists, manufacturers, labor leaders, military men, and others chosen not on political grounds but by their peers in their own professions or callings.

Speaking on "National Survival Through Science," Dr. Holmes said that the chief hope of survival of the United States as a free nation lies in the resourcefulness of its scientists. "Exploded completely is the complacent isolationist idea that this country has all the needed national resources. All that will save us is the national resourcefulness of our scientists."

Dr. Holmes devoted much of his address to developments in the field of synthetic rubber.

"A scientific miracle is certainly called for to save the alarming rubber situation. With only an ordinary year's supply in our stockpile, 350,000 tons of reclaimed rubber possible for this year and an equal amount for next year, practically none instead of 97 per cent of our supply coming from the East Indies and only 30,000 to 50,000 tons of imports from South America and Liberia possible for 1942, the situation is serious. The Army, Navy and Air Forces must have huge quantities of good rubber or they will lose this war.

"The only hope, and it is a very promising hope, is that the chemist and engineer will make synthetic rubber at the amazing rate of 500,000 tons or even 1,000,000 tons yearly, before it is too late. We know how to make synthetic rubbers, several of them, but time is of the essence after a tragically late start and metals for plant construction are seriously limited in quantity.

"Molders of a Better Destiny"

While Dr. Holmes was depicting the place of the chemist in the present emergency, Dr. Charles M. A. Stine, famous du Pont scientist, was drawing before a spell-bound audience a remarkable portrait of the future. Said Dr. Stine—"Under the pressures of war, chemical developments are proceeding so rapidly that the world of 1940 has already become an antiquity. The inconceivables of only two years ago are today's realities."

Dr. Stine emphasized that the war is compressing into the space of months developments which might have taken us half a century to realize if necessity had not forced the pace.

"These pressures are unprecedented," he said. "The developments are unprecedented. Give us a victorious peace and the freedom of enterprise it should guarantee, and our progress will be unprecedented . . . Let our swords be mighty, and mighty indeed will be our plowshares."

Declaring that the outlines of this progress have already been traced. the Du Pont chemist enumerated many separate scientific revolutions which are on the way.

Aluminum production by the end of next year, he said, will be seven times greater than it was in 1939 after fifty years of development. It will furnish in one year enough metal to build three times the number of passenger cars now operating on all American railroads.

Under war pressures to create better fuels for airplanes so much progress has been made, he declared, that "the petroleum chemist now sees all existing motors as out of date," for fuels can now be made that go beyond the octane scale.

"Since motor car production stopped," he added, "the shiny new models that are

gathering dust in dealers' storerooms have aged, technically, at least two decades. We are now in the 1960's of motor cars, as measured by the old pace of development."

There will be sealed cooling systems, now used in aviation; weights may be half what they are. Power will be up and fuels may yield 50 miles to the gallon.

"The newest and most versatile of plastics will be available after this war on a scale beyond all previous conceptions," Dr. Stine asserted. "The high-pressure synthesis of ammonia, one of the major chemical exploits of the century, will have taken on an industrial status that, in terms of new producing capacity, may be comparable to the discovery of a sixth continent. The amount of fertilizer chemicals that this new capacity will be able to supply farmers will be so large that the basic trends of agriculture might be changed.

"And these are but one group of a hundred or more products stemming from this high-pressure synthesis, which utilizes air, coal and water as its building blocks. We will have glass that is unbreakable and glass that will float, wood that won't burn, and laminations of plastics and wood that will compete with structural metals. Hosiery derived from air, water and coal, a wonder of pre-war days, is but the forerunner of many innovations from the same source, ranging from shoes that contain no leather and window screens that contain no wire, to machinery bearings that contain no metal."

Until a few years ago, he pointed out, magnesium was a structural curiosity, while today, on the average, almost half a ton of it, taken largely from sea water by a chemical process, goes into every fighting plane that is built. After the war the nation's capacity for producing this lightest of all structural metals will be more than double its aluminum output in 1939.

"The nation will emerge from this war," declared Dr. Stine, "with capacities for making plastics, synthetic fibres, nitrates, hydrocarbons, high octane gasolines and literally scores of chemical and other raw materials on a scale that only two years ago was beyond our comprehension."

More than a century, he said, was consumed in bringing the crude rubber production of the world up to a million tons a year.

"The United States alone," he declared, "is now undertaking to accomplish almost as mighty a feat in less than two years by the manufacture of chemical rubbers from petroleum, alcohol, coal and limestone."

Mentioning the four freedoms of President Roosevelt in the Atlantic Charter, and the fifth added by Herbert Hoover—freedom of economic enterprise—Dr. Stine said:

"The scientist accepts these freedoms unreservedly. To their attainment he is glad to give life itself, if that is the price. But the scientist is fighting just as wholeheartedly for five hundred, yes, for five thousand other freedoms . . . the freedom to worry through with a theory until it is validated or disproved, the freedom to banish the wasteful and enthrone the efficient; the freedom to improve, if he can, everything that exists under the sun, and, beyond that, to create things upon which the sun has never before shone."

Those attending the general meeting held on Wednesday afternoon, Sept. 9, were greatly disappointed when the paper "Progress of Synthetic Rubber Production," by Dr. E. R. Weidlein was withdrawn at the last minute. However, Dr. Albert L. Elder of WPB in a paper particularly frank in its disclosures discussed the status of the production of butadiene.

The proposed yearly rate as outlined is 717,800 tons. The engineering and drafting is approximately 60 per cent completed and the commitments made for about 40 per cent of the materials. The new plants are expected to come in at the following yearly rate:

September, 1942	13,300 tons
November, 1942	9,500 tons
January, 1943	20,000 tons
February, 1943	20,000 tons
March, 1943	165,000 tons
April, 1943	135,000 tons
May, 1943	40,000 tons
June, 1943	170,000 tons
July, 1943	40,000 tons
August, 1943	55,000 tons
October, 1943	50,000 tons
Total	717,800 tons

"Those who look upon the creation of the billion dollar synthetic rubber industry as a war baby, which will disappear with our victorious conclusion of the war, may be mistaken," the speaker refuted. "Those needless debates on butadiene from petroleum vs. butadiene from grain, which are based on the theory that synthetic rubber is a war baby and hence it will be easier to close it down if butadiene is produced from petroleum than if thousands of farmers are put out of work, should end for the duration of the war. Technical men realize that if improvements in the future developments of synthetic rubber continue as they have in the past, natural rubber at any price might not be able to compete with synthetic rubber.

"We may have only scratched the surface with these developments. It is conceivable that plant equipment will be greatly simplified, low molecular weight butadiene polymers may be formed and used, less pure butadiene may be required, separations simplified, handling costs reduced and the final synthetic rubber greatly improved. The technical men may develop short cuts and the use of low grade butadiene and thereby make rapid advances in the output of synthetic rubber."

Elder in his report to the chemists of the nation promised that by the end of 1943, synthetic rubber will be rolling out at a yearly rate of 950,000 short tons or about 750,000 long tons. Butadiene production will be scattered through seven states and divided among 12 companies.

Alcohol will supply 220,000 tons of this butadiene, and petroleum the rest. The list of cities, companies, dates in 1943 when the plants are to be completed and capacity in tons follow:

Using alcohol:

Pittsburgh, Koppers United [four plants], April, 20,000 tons; May, 20,000; June, 20,000; July, 20,000.

Louisville, Carbide and Carbon [three plants], May, 20,000; June, 20,000; July, 20,000.

Institute, W. Va., Carbide and Carbon [four plants], January, 20,000; February, 20,000; March, 20,000; April, 20,000.

Some Using Petroleum

From petroleum, with four petroleum raw materials:

Los Angeles, Shell Chemical, March, 85,000 tons.

Shreveport, Atlas Oil, November, 9,500.

Baton Rouge, Standard Oil of Louisiana [two plants], March, 15,000; September, 8,300.

Charleston, W. Va., Carbide and Carbon, September, 5,000.

Baytown, Tex., Humble Oil, March, 30,000.

Sarnia, Canada. Imperial Oil, Ltd., June, 30,000.

Port Neches, Tex., Neches Butane Products [two plants], April, 50,000; June, 50,000.

Houston, Tex., Sinclair, October, 50,000.

Lake Charles, La., Cities Service, August, 55,000.

Berger, Tex., Phillips Petroleum, April, 45,000.

Toledo, O., Sun Oil, March, 15,000.

The 1942 locations where butadiene is being produced were not announced.

Details on styrene production likewise were not disclosed.

Willard H. Dow, president of Dow Chemical, told the general meeting that commercial development of styrene, another component of one type of synthetic rubber, did not originate with purchase of the German process. It is a tribute to the ingenuity and foresight of American chemists, he said.

Lieut. Gen. William S. Knudsen, Army production chief, declared in his address at the banquet we have a "fair start" in vital war production and gave full credit to President Roosevelt and Secretary of State Cordell Hull for giving the United States a year and a half grace on the war effort by diplomatically stalling Pearl Harbor.

The main speaker at the society's annual dinner, Knudsen said "We don't want by any means to infer that we have this job 'in the bag,' but we have taken the heaviest and most difficult steps on the road to winning this war."

Technical Advances Reported

Development of the new procedure for the fractionation of natural oils and fats resulting in products similar to cocoanut oil of the Philippines, palm oil of the Dutch East Indies, and perilla oil of Japan was reported by Dr. Stephen E. Freeman, chemist in the paint division of the Pittsburgh Plate Glass Company, Milwaukee, Wis.

In a paper presented before the Division of Paint, Varnish, and Plastics Chemistry of the Society, Dr. Freeman said the process "has already passed through the pilot plant stage and has been for some months in limited production."

Nearing completion is a full scale commercial plant capable of operating on any of the natural domestic oils. This first unit will be operated to fractionate linseed oil to provide replacements for China wood and perilla oils no longer entering the country from China and the Far East.

The Freeman process depends upon the action of selective solvents in countercurrent extraction. It was found the different glycerides had different solubilities in certain solvents and that by contacting the oil with these solvents in suitable equipment, the more soluble members could be removed. Thus the whole oil could be separated into two or more widely different fractions differing not only in solubility but in physical properties and utility as well.

The implications of this process are far-reaching, according to Freeman. "It is possible to separate domestic linseed oil, for example, into two fractions, one of which closely resembles perilla oil and approaches China wood oil in properties and the other of which more nearly resembles soya bean oil. Soya bean oil can be separated into fractions essentially similar to linseed and cottonseed oils, respectively. Since soya bean oil production is being rapidly expanded in the United States, it is extremely gratifying that processes are at hand whereby its utility may be greatly enhanced. So it is with all of the natural oils and fats. They are all capable of being converted into 'tailor-made' fractions especially adapted to a specific use in American industry."

Lower Cost Alcohol?

A new process of obtaining alcohol for synthetic rubber and ammunition from waste, watery solutions, was announced.

The new method will lower the cost of obtaining alcohol, according to a report presented to the Society's Division of Industrial and Engineering Chemistry by Drs. Donald F. Othmer and R. L. Ratcliffe of the Polytechnic Institute of Brooklyn. The process has been successfully tested by experimentation, it was explained. Waste materials from agriculture, paper mills, and from the treatment of sawdust and wood waste could be utilized.

"The discovery may open up potential sources of tremendous amounts of alcohol hitherto neglected at a time when these potential sources of alcohol could carry the entire synthetic rubber program as well as supply the large amounts needed in manufacture of powder for shells," the report said.

"For almost two thousand years, alcohol has been distilled to separate it from fermented liquors. For the first time another method is used. The new process washes it out with an oily liquid, fusel oil, an impurity which comes in the fermentation and has always been a major nuisance up till now.

"This method of separation of alcohol from dilute solutions cuts down the heat cost tremendously and, of equal importance, greatly reduces the amount of critical copper and steel required for the equipment.

"The alcohol is washed out of the watery fermentation liquor with the fusel oil which does not mix with water but does mix with alcohol, and has the power of taking the alcohol away from the water. The alcohol may then be readily separated from the oil; and the whole process requires only about one-third as much heat as the distilling process—devised so long ago and universally used since.

"Many sources of dilute alcohol would be available to give, taken together, the tremendous amounts of alcohol required for the production of the synthetic rubber now required in this country.

"Fermentation of many agricultural waste materials and of liquors which are a nuisance to paper mills yields the same alcohol as is obtained from fermentation of valuable grain and molasses, but the liquors are too dilute. There may also be used for this fermentnation, and recovery of alcohol by the new washing process, the liquors coming from the treatment of sawdust and wood waste with water at high temperature.

"The solutions coming from all these sources cannot be utilized practically where they now are made; and they are not made where they should be made because the cost of distilling the alcohol out is too great. The new process lowers the cost of obtaining the alcohol.

"Not only may alcohol be so separated from dilute watery sub-solutions economically by the new process as contrasted to the classic distilled process, but there may be sepasated many other liquids, such as acetone, which is also important in the making of smokeless powder, rayons of the Celanese type, plastics, and so forth."

Source of B_2-Vitamin

Cheaper vitamin B_2, a major factor in the fortification of flour, is possible through the large-scale production of a rare sugar, esesntial to the vitamin's synthesis, from yeast derived from paper mill liquor now being dumped into woodland rivers, Dr. Jonas Kamlet of the chemical research division of Miles Laboratories, Inc., New York, told the Division of Medicinal Chemistry.

Through the invention of a Swedish engineer, G. Heijkenskjold, there are now two plants in Canada producing low-cost yeast needed for the ribose-from-yeast process. The erection of similar plants in the United States after the war is contemplated, Dr. Kamlet said.

Treatment of Fuel Oils

A novel process for removing the ash forming constituents from residual fuel oils has been developed by the Research and Development Laboratories of Socony-Vacuum. This unique process employs boric acid at elevated temperature for removing the alkaline constituents of "soda tars" resulting from the distillation of crude oil in the presence of sodium hydroxide. The removal of these constituents is of considerable economic importance because it eliminates formation of alkaline ash which reacts with the furnace refractories causing their rapid disintegration.

In this new process, a mixture of soda tar and boric acid is vigorously agitated at about 400 degrees Fahrenheit under 250 pounds per square inch pressure and the reaction products are separated by settling. The boric acid may be recovered from the boric acid sludge for reuse in the process by simple acidification, crystallization and filtration.

The use of the process will permit the refiner to produce high grade industrial fuel oils from inferior grade materials which may be now considered as a "drug on the market" and which can be disposed only in blends with other oils. The consumer will be likewise benefited by a reduced maintenance cost of his heating equipment.

New Vanadium Source

Special interest was shown in the process for recovering vanadium from Idaho's phosphate rock reported by Dr. J. Perry Morgan of Standard of New Jersey working with Dr. Arthur W. Hixson of Columbia.

Essentials of the new process for extracting vanadium: phosphate rock is dissolved in sulfuric; then nitric is added to precipitate the vanadium in powder, then cake form. This will be marketed to alloy-steel manufacturers as vanadium pentoxide.

Anaconda Copper at present is said to be processing some 100,000 tons of rock a year. By this new process about 200 to 250 tons of vanadium can be obtained—approximately 25 per cent of the annual requirements of the United States.

BETWEEN THE LINES

The government's fats and oils program is a well-coordinated and well set up affair. Although production will be up, our imports will be more than a billion pounds under last year's. Read what's being done on this supply problem.

TOTAL United States production of fats and oils for the year which began July 1, 1942, is estimated at 11.6 billion pounds, two billion pounds over the previous year. Imports by the United States in the same period will be probably more than one billion pounds under the preceding year. This decrease reflects not only the loss of a vast area formerly relied on for supplies, but also a stringency in shipping.

Under United States commitments for Lend-lease, and its own expanded requirements, even the increased production represented in the above figures is recognized as inadequate. Accordingly there is presently a great deal of activity in the direction of organizing available supplies, purchases, and disposition of all fats and oils, as well as much planning for augmenting the quantities anticipated. Needless to add, this activity is largely dominated by governmental authorities, so tight has the situation become.

Looking at the situation solely from the viewpoint of official actions, it is necessary first to know what the United States government contemplates as essentials in its program. Provision must be considered for existing stocks, and for prospective domestic, civilian, military and Lend-lease needs, and for a reserve against future contingencies.

As an index to the Lend-lease situation, Britain normally obtains some 95 per cent of its requirements from the Pacific area, Africa, India, South America, and from the United States. Where the United States is under comparatively moderate restrictions in this field, the basic civilian ration in Britain is now about eight ounces of fats and oils per week, including not over two ounces of butter.

With respect to Lend-lease, which involves more than solely British requirements, there has just been set up an arrangement by which the United States through certain Washington agencies, will act as purchaser in specified areas of the world, and Britain as purchaser in others, through a coordinated plan of purchase and importation of badly needed oils and fats. These countries will act for the others concerned in thus attempting to round up such supplies as are available.

Elaborating somewhat on the detail, the United States for instance, will act for the following commodities and in the areas listed; all oilseeds, oils, fats except animal in Argentina and Uruguay, from all North and South American sources; copra in Tahiti and all Free French islands; all oilseeds and oils and fats, from Portuguese Africa, Spanish Africa and Liberia.

Britain will act in Argentina and Uruguay for all animal fats; for all oilseeds and oils and fats in British Empire areas except in North and South America; all oilseeds, oils and fats, from Free French Africa, and the Belgian Congo. (It may be recalled that an American occupation force is rumored in the Belgian African possession, and that British are now dominant in Madagascar, among other sources.)

Allocation Procedure

The supplies thus obtained will be allocated according to a pre-arranged basis. Meanwhile, within this country, the basic restrictions governing total consumption of fats and oils are embodied in WPB's general preference order M-71 which was issued September 28. This order, though its limitations and allocations, is intended to provide some reserves against possible further loss of supply areas or unexpected demands.

United States consumption has been blocked out on existing statistics as about one-third for soap, glycerine, paints, varnishes, lacquers, and other industrial uses, and large percentages for various food products.

Under the consolidated British-United States purchasing procedure, and other governmental requirements, the Commodity Credit Corporation (government) and other Federal agencies notified importers of vegetable fats and oils of the products desired and days of purchase; Babassu oil and kernels, cashew nut shell oil, castor seed and oil, coconut oil, copra oil, muru muru oil, neatsfoot oil, uricury oil, oiticica oil, palm kernels and kernel oil, palm oil, rapeseed oil and tucum oil.

The Federal government also has fostered a plan for an association for the war period, of importers to be known as the Emergency Group for Foreign Vegetable Oils, Fats and Oil-bearing Materials.

Shortly before some of the actions cited here (M-71) the War Production Board moved, through a supplement to its earlier order M-60, to freeze an additional 25 per cent of inventory stocks of coconut, babassu and palm kernel oils, when held by persons with 240,000 pounds or more on hand. This action bolsters an earlier freezing order (March 20, 1942) but which applied to stocks exceeding 30,000 pounds and included all high lauric acid oils. The second freezing order applied only to large inventories as noted, and included only the three principal sources of high lauric acid oils. Furthermore, 25 per cent of all future imports of the three are frozen under this latest order, and applies to materials containing these oils as well as the oils.

The purpose is to conserve lauric acid oils, most of which are imports. While it is true that Brazil furnishes a considerable source of supply, shipping enters the picture here, and in respect to some other oils and essential oils to be mentione

At about the same time as this action the government also found it advisable to place castor oil under complete allocation control. (Order M-235) Exceptions are made in favor of small users, 35 pounds or less per month, and for certain specified uses.

Part of the general activity on fats and oils also was an OPA move to establish price ceilings for various grades and quantities of soybean oil, corn oil and peanut oil. In the face of the import conditions as of today the government is concerning itself on an intensive scale with increased production of soy oil and among others, linseed oil.

In the field of essential oils the government has been active both on the home front and abroad. Ostensibly to aid i that country's internal economy, earlier in the year, experts from the U. S. Department of Agriculture's division of Latin American Agricultural Affairs, which few people in the United States will have heard about until now, were in Brazil. That South American country furnishes besides babassu oil, and may possibly be able to furnish other supplies not now regularly imported. These experts also examined the possibility of increasing production of essential oils in Paraguay.

Thus they hoped to offset the threat to supplies from more established sources in the Mediterranean and across the Pacific. Paraguay for instance, furnishes most of the world supply of petitgrain oil for cosmetics production; Dr. Wilbur V. Harlan, one of the department experts referred to, reported on the possibilities in South America;

"From time to time pioneering individuals have started plantings of a few types of essential oil-bearing plants here and there in Latin America, but none has succeeded. Paraguay uses some crude cultivation in the production of petitgrain oil, which is distilled from leaves of the bitter orange, and a small amount of oil is obtained from lines grown on plantations in various of the Latin American countries. Otherwise the industry in

Factory Production and Consumption, and Factory and Warehouse Stocks of Animal and Vegetable Fats and Oils, Quarter Ending June 30, 1942 and 1941

(In some cases where products were made by a continuous process, the intermediate products were not reported. Stocks include some imports not withdrawn from bonded warehouses during the period)

Kind	Factory Operations for the Quarter Ending June 30				Factory and Warehouse Stocks June 30 (1,000 pounds)	
	Production (1,000 pounds)		Consumption (1,000 pounds)			
	1942	1941	1942	1941	1942	1941
Vegetable Oils						
Cottonseed, crude	147 263	210.737	243.148	324 714	51.291	51.961
Cottonseed, refined	224 857	303 990	232 482	402 720	369 745	372 756
Peanut, virgin and crude[1]	10 209	39.768	10.951	40.074	9 065	14 650
Peanut, refined	10.111	38.101	9 464	38 901	19.085	41 029
Coconut, crude	17 740	81.054	35 085	184.122	126.087	176 391
Coconut, refined	13 512	90 962	12.995	68 973	10 017	15 064
Corn, crude	63 097	50.326	60.560	46 785	26 074	15.610
Corn, refined	54 689	41 920	26 690	15 003	22 310	9 145
Soybean, crude	167 945	141.180	164.880	144 755	78 719	34.823
Soybean, refined	147.269	126,301	123.400	104.740	76.098	40.606
Olive, edible	.....	.....	358	911	7 124	7 777
Olive, inedible	[2]	.....	726	836	663	1,546
Sulfur oil or olive foots	.....	.....	1,098	2 847	12 485	14 816
Palm-kernel, crude	[2]	[2]	370	3.201	697	4.114
Palm-kernel, refined	124	2.813	232	2 764	546	1 687
Palm, crude	.....	.....	25.354	73.141	99 253	115.134
Palm, refined	161	22 759	1.868	25 995	9 684	3 426
Babassu, crude	[2]	12.475	4.930	16 084	17.480	5 396
Babassu, refined	722	6,378	2.834	5.092	459	977
Rapeseed	.....	.....	3 262	3 732	14.252	9 742
Linseed	241,015	183 309	151 183	143 232	225 615	151 035
Chinese wood or tung	878	2.251	3.224	15 829	32 425	37 374
Perilla	.....	.....	720	1.959	2 985	8 8'6
Castor	48.276	34.965	27.665	21.853	34.654	15.286
Sesame	.....	.....	106	427	130	688
All other	13.815	5,512	12,008	6.266	34.984	12.562
Fish Oils[3]						
Cod and cod-liver	245	239	3.949	7.417	11.144	14.412
Fish oils	[4]7,871	[4]11,384	30 076	41.863	97.503	70 247
Marine mammal oils	41	90	8,773	5.287	51.893	39.004
Animal Fats						
Rendered pork fat	42.385	38 362	16.098	14.573	15.689	11 798
Lard, including neutral lard	404.373	380.376	5.661	4.359	98 708	372 946
Tallow, edible	27.009	22 191	12 912	13 248	11 557	9 205
Tallow, inedible	224.446	202.132	342 280	302 842	237.108	289 081
Neat's foot oil	1,460	1,007	2,305	1.744	2,808	1.547
Greases						
White	34,014	30.313	29.383	39.884	13.233	26.401
Yellow	35,184	31.139	73 673	53.549	52 412	53 884
Brown	26.657	24.035	13,425	14.425	12.110	13.172
Bone	8.585	8.086	250	194	1.331	1.122
Tankage	12,370	12 470	1.244	1.800	3.065	3.169
House	10.948	10,503	4.297	4.909	4 200	3.264
Wool	4.107	3.625	3 470	2.654	5.185	6 916
Garbage and other greases	9,322	7,894	9.278	8.749	10,508	8.548
Other Products						
Shortening	246,304	410.382	622	847	63.208	45 967
Hydrogenated oils	220,454	244.910	212.819	245.172	27.546	26 440
Stearin, vegetable	14.378	24.506	11.774	24.070	9.375	6 092
Stearin, animal, edible	14,991	11,461	9 969	7.802	5 982	5.509
Stearin, animal, inedible	12.369	10.182	4.279	4.742	7.369	5.937
Oleo oil	27.304	24.540	6 108	4.576	9.629	8 274
Lard oil	17,622	14.779	8.232	5.766	5.490	4 528
Tallow oil	2.4 8	2.671	2.027	1.720	2.069	1.780
Fatty acids	22.323	42.604	17.177	27.614	13 843	10.717
Fatty acids, distilled	20.679	13.273	12 151	5.257	12 898	6.591
Red oil	21.289	19 489	12.985	11.998	[5]12 986	[5]7 371
Stearic acid	13.628	13.589	5.251	4.848	[6]10.413	[6]5 297
Glycerin, crude 80% basis	59.242	66.403	61.717	69.098	15 979	23 267
Glycerin, dynamite	26 272	25.884	14.479	14.796	26.799	27 292
Glycerin, chemically pure	21.903	27.334	6.654	10 252	33.377	24.171
Cottonseed foots, 50% basis	28.002	30.014	33.626	32.357	25.116	20.153
Cottonseed foots, distilled	11.052	10,118	8.351	6.862	2 025	3.3'2
Other vegetable oil foots, 50% basis	17,933	30,036	12.598	20.464	3,364	4.834
Other vegetable oil foots, distilled	583	542	33	.....	235	109
Acidulated soap stock	15,646	14,580	15,145	17.571	32.733	24.697
Miscellaneous soap stock	662	634	731	782	1,298	579

[1] *Agricultural Marketing Administration collected the data from peanut oil producers.*
[2] *Included in "All other" vegetable oils.*
[3] *Fish and Wildlife Service collected the data from fish oil producers and includes consumption of certain vegetable oils by fish canners.*
[4] *Includes 1,290,000 pounds of herring and sardine, and 4,351,000 pounds of menhaden for 1942; and corresponding figures for 1941 of 2,663,000 and 6,625,000.*
[5] *Includes 4,630,000 and 2,727,000 pounds in hands of producers 1942 and 1941 respectively.*
[6] *Includes 2,935,000 and 982,000 pounds in hands of producers 1942 and 1941 respectively.*

the Americas is based largely on wild plants.

"While increased harvesting of these wild crops will undoubtedly be of value in meeting the present emergency, any permanent and efficient industry would certainly have to be based on cultivated plantings."

Many obstacles are seen in this course, however, it has been now reported that the colony of European refugees established in Santo Domingo expect to make production of essential oils one of their most important sources of income, and has under way important plantings of citronella, lemon grass, and ylang-ylang. In Haiti lemon grass is being grown, and promising development work is under way in Puerto Rico looking to high-yielding strains of several established oil plants. Unique in this respect, extraction of essential oil from the coffee flower has been reported there.

However, the supplies of waxes, both vegetable and other, of vegetable and tree oils, and animal fats, reposing in Latin American countries are not as accessible as might have been expected. Shipping is at a premium, and with coffee being rationed because space is not available for its transportation, it can be realized that other supplies are also difficult to bring in.

The purpose in attempting to develop Latin American supplies is both with a view to the present situation as far as possible, and to the long-range one, that in a future contingency this country may not again be caught as it was when the Far East went under an enemy flag.

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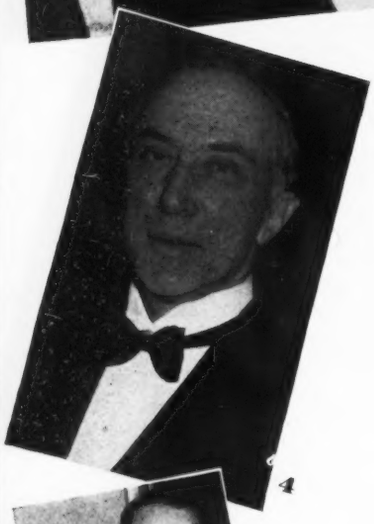

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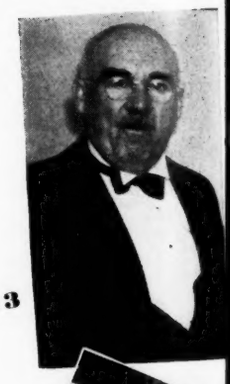
N.W.D.A. Victory Banquet Draws a Record Crowd

A gala Victory Banquet, proceeds of which went to Army Relief and the U. S. O., was held under the auspices of the National Wholesale Druggists Association Sept. 29 at the Waldorf-Astoria, N. Y. City. Percy Magnus of Magnus, Mabee & Reynard was chairman of the event which drew a record attendance. Walter O'Keefe was master of ceremonies for the entertainment program. Vaughn Monroe and his orchestra supplied the music.

On these pages, CI presents some photos taken by the roving photographers at the affair.

(1) H. H. Rosenthal, E. F. Frank and Albert Nordt, all of H. H. Rosenthal Co. (2) A. C. Boylston, president of Mallinckrodt. (3) Left to right, J. P. Remensnyder, George Simon and Arthur H. Rowe, all of Heyden Chemical. (4) Preston Furman, Heyden Chemical. (5) Lt. George Uhe, formerly of the company bearing his name, now with the Sanitary Corps. (6) Ralph M. Stevenson, Givaudan-Delawanna, Inc. (7) S. B. Penick, Jr , S. B. Penick Co. (8) General Drug Co table, Carl K. Wellenkamp on the left. (9) Left to right, Ralph Clark, J. T. Baker Chemical, Dr. J. C. Bird, Vick Chemical Co. and Charles Slater, J. T. Baker Chemical. (10) C. D. Davis, National Oil Products. (11) Turner Currens, former president, Drug, Chemical & Allied Trades Section, N. Y. Board of Trade, now with the Drug Section, WPB. (12) Dr. C. M. Bigelow, Calco Chemical. (13) John T. Stebe, McKesson & Robbins.



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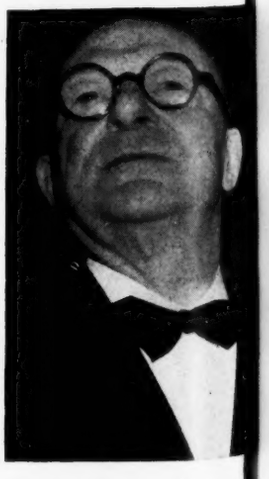

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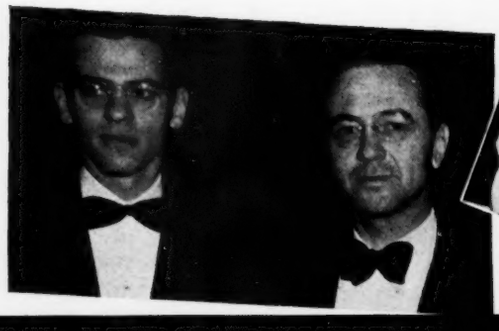
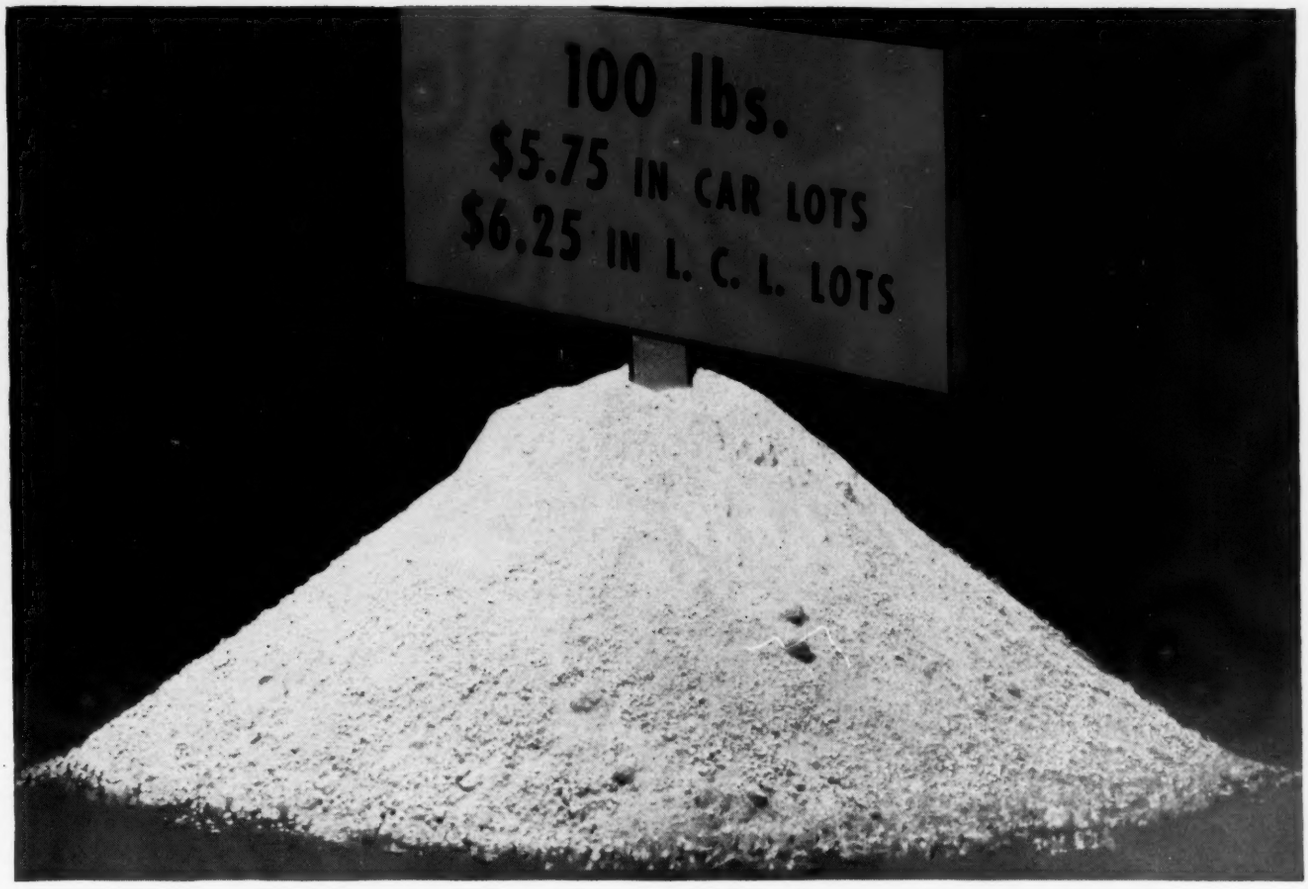
More Shots of the Victory Banquet



(1) Grover Whalen and Mrs. Percy C. Magnus. (2) Percy C. Magnus, chairman of the Victory Banquet. (3) Ralph E. Dorland, Dow Chemical. (4) Robert B. Magnus, Magnus, Mabee & Reynard. (5) Powers models overflowed the banquet; their job to sell War Bonds and more War Bonds. These were two of them and did *they* sell War Bonds! (6) Mr. and Mrs. Warren White, Sisson Drug Co. (7) George M. Armour, McCormick & Co. (8) Major E. Shea, U. S. Sanitary Corps. (9) W. J. Schieffelin, III, and W. J. Schieffelin, Jr. (10) L. A. Keane, U. S. Industrial Chemicals, Inc. (11) August A. Wasserscheid, Mallinckrodt Chemical Works.



CAN YOU USE THIS ZINC OXIDE?

Here is an excellent opportunity for manufacturers who can use recovered zinc oxide with these specifications:

color	light grey or tan
loss on ignition (organic matter)	5.0% maximum
inorganic impurities (principally sulfate)	3.0% maximum
assay (Zinc as ZnO)	90.0% minimum
fineness retained on 100 mesh	none
retained on 200 mesh	0.1% maximum

Ample Stocks Available!

While zinc oxide meeting the specifications at the left cannot be recommended for white paints, many other uses suggest themselves:

1. as a pigment in certain tints of linseed oil house paints or industrial coatings such as tans, buffs and similar colors

2. as a raw material for zinc chromate pigments

3. as a pigment in colored linoleum print paints

4. in the meal used in making inlaid linoleum

At present ample stocks are available and this zinc oxide is being offered in car lots (minimum 40,000 lb.) at $5.75 per 100 lbs. F. O. B. St. Louis, freight allowed to destination. In L. C. L. quantities, 300-lb. barrels are offered at $6.25 per 100 lbs.

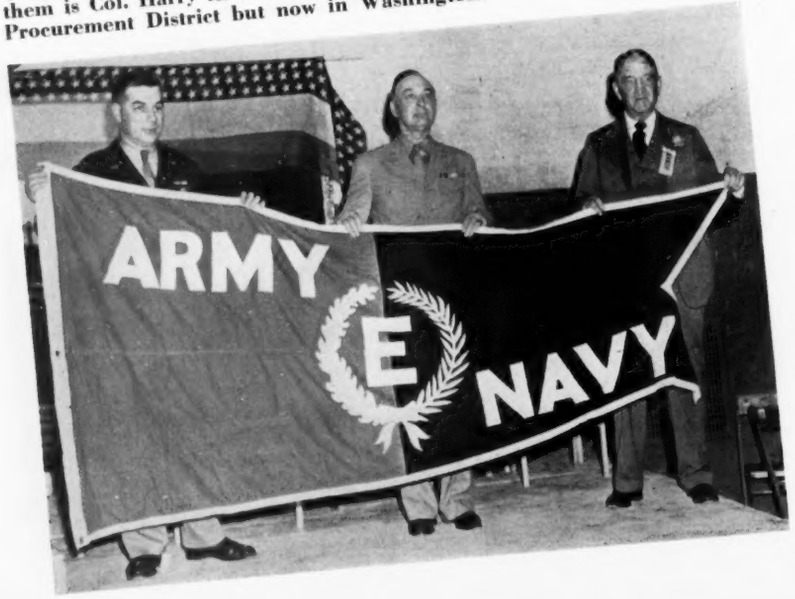
For samples and further details, inquire: MONSANTO CHEMICAL COMPANY, Organic Chemicals Division, St. Louis, Mo. District Offices: New York, Chicago, Boston, Detroit, Charlotte, Birmingham, Los Angeles, San Francisco, Montreal.

MONSANTO CHEMICALS
SERVING INDUSTRY...WHICH SERVES MANKIND

"E" FOR EXCELLENCE—The joint Army-Navy "E" burgee, "representing recognition by both the Army and the Navy of especially meritorious production of war materials," has been awarded to Monsanto and now replaces the Navy "E" first awarded Monsanto December 31, 1941.

Above two shots were taken at the recent award ceremonies of the Army-Navy "E" to Carbide & Carbon Chemicals Corp. at South Charleston, W. Va. Top photo shows the raising of the pennant. Bottom photo shows J. A. Rafferty, president of the company, making his speech.

Below: In ceremonies held at the Hooker Electrochemical plant, Niagara Falls, President Harry M. Hooker received the joint Army-Navy "E" award on behalf of the employees. Flag was presented to Hooker (right) by Maj. Gen. William N. Porter, Chief of CWS (center). With them is Col. Harry A. Kuhn, formerly of the N. Y. Chemical Warfare Procurement District but now in Washington.



Headliners in the News

Below, from top to bottom: Samuel C. Harris, director of sales of Du Pont's Electrochemicals Dept., completed 25 years of service last month and was honored at a luncheon given by his associates. James A. Wilson has been promoted to assistant plant manager of the Trenton, Mich., plant of Monsanto Chemical Co. Eugene M. Hetzel has been made superintendent of Monsanto's Carondelet, Mo., plant, of which Wilson was formerly superintendent.

Personalities at the Buffalo A. C. S. Meeting

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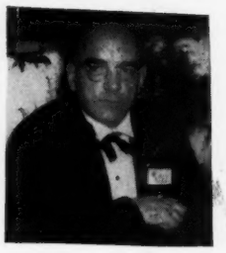

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C I's roving photographer took these candid shots at the recent Buffalo meeting of the American Chemical Society. For detailed information on what took place at the meeting see page 524.

(1) A. C. Lansing and A. G. Hovey of Reichhold Chemicals Inc. (2) Dr. Frank C. Whitmore, former president of the A. C. S. and dean of the School of chemistry and physics, The Pennsylvania State College. (3) Charles L. Gabriel, Publicker Commercial Alcohol Co. and Earl L. Whitford, Oldbury Electro-Chemical Co. (4) Dr. E. C. Williams, director of research for General Aniline, and Dr. Harrison E. Howe, editor, *Industrial & Engineering Chemistry*. (5) Charles A. Buerk, president of Buffalo Electrochemical Co. and Milton Kutz, Electrochemical Division, Du Pont. (6) F. H. Bivins, Bristol-Myers. (7) Dr. Arthur B. Lamb, Harvard University, at the left, and Dr. E. R. Weidlein, director of the Mellon Institute of Industrial Research and consultant to the government on synthetic rubber, at the right. (8) Richard M. Lawrence, Atlas Powder Co., Jack Barsha, Hercules Powder Co., and Howard Adler, Victor Chemical Works. (9) H. F. Roderick, director of research, Michigan Alkali Works. (10) Professor Donald B. Keyes, head of the department of chemical engineering, U. of Illinois, and consultant to the WPB. (11) George F. Rugar, Hooker Electrochemical Co.

SALVAGE

— — — A BIG WORD IN THE CHEMICAL PROCESS INDUSTRY

With the word "salvage" uppermost in the minds of all of us on the home front, let's make sure that the Chemical Process Industry is doing its share in "salvaging" and conserving war-essential chemicals.

Many companies are saving untold gallons and pounds of chemicals by the recovery or reclamation of acid, alkali, dye, and other liquors . . .

BY TREATMENT WITH NUCHAR ACTIVE CARBON

Check through the following list of chemical products being either recovered or reclaimed by simple low-cost treatment with NUCHAR Active Carbon . . . your plant might be wasting one of these right now, or they might give you an idea on the use of Nuchar for a similar product which you are now discarding after a single use: Recovery of Iodine, Tungsten, Phenol, Glycerin, and Sodium Glutamate; Reclamation of Electroplating Solutions, Dry-cleaning Solvents, Acetic Acid, Formic Acid, Muriatic Acid, Cellulose Acetate, Nitrate, Scrap Paraffin, and Sulphuric Acid.

NUCHAR

INDUSTRIAL CHEMICAL SALES

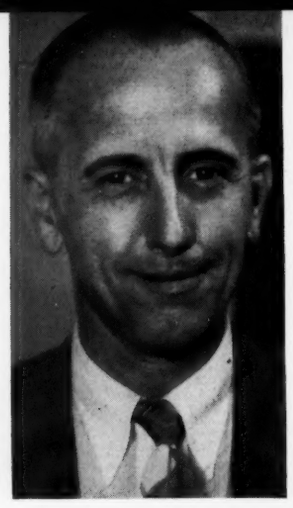
DIVISION WEST VIRGINIA PULP & PAPER COMPANY

230 PARK AVENUE, NEW YORK CITY
35 E. WACKER DRIVE, CHICAGO, ILLINOIS
748 PUBLIC LEDGER BLDG., PHILADELPHIA, PA.
844 LEADER BLDG., CLEVELAND, OHIO.

and more personalities . . .

Here are some more taken at the Buffalo A. C. S. meeting. (1) Dr. R. W. Borgeson, Pennsylvania Salt Manufacturing Co. (2) Dr. Stanley Baker, Sperti, Inc., Cincinnati. (3) C. M. Olson, Oldbury Electro-Chemical Co. (4) R. F. Gould, Buckeye Cotton Oil Co., Memphis. (5) Ernest R. Bridgewater, E. I. du Pont de Nemours & Co., Inc. (6) B. A. Shippy, Jersey Zinc Co. (7) Dr. Elmer K. Bolton, chemical director, E. I. du Pont de Nemours & Co., Inc. (8) General banquet scene taken at the United Nations Dinner.

1



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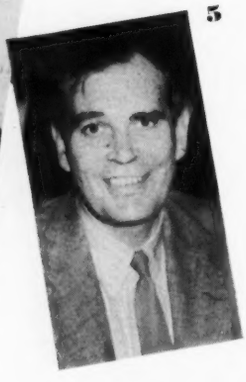

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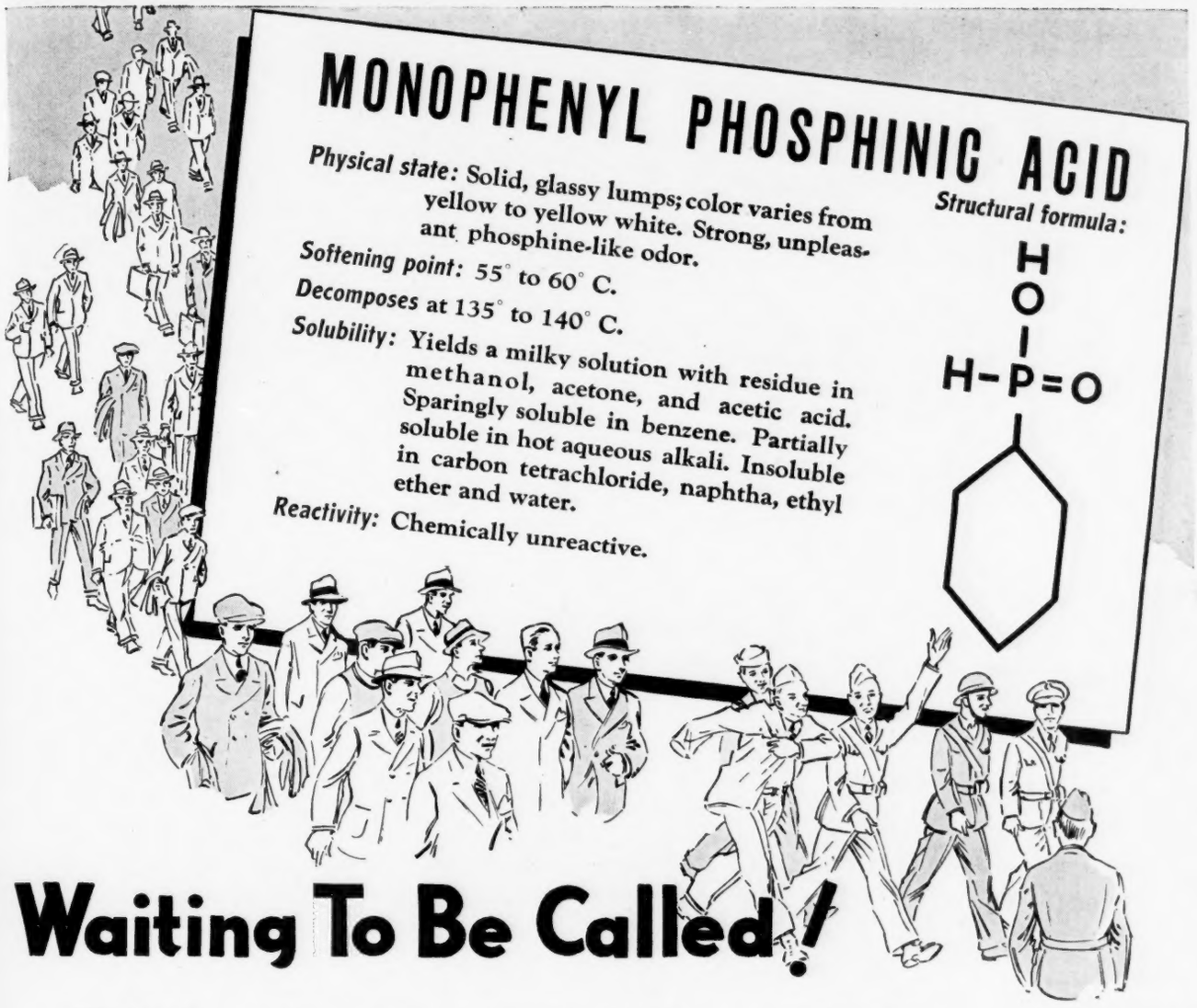


Waiting To Be Called!

TODAY . . . millions of young men in all walks of life . . . await the call to the service of their country.

Today . . . in the Victor Research Laboratory . . . scores of phosphorus compounds similarly await the call to service of industry.

Phosphorus unites readily with other elements . . . producing countless unusual compounds such as that briefly described above. For many, no practical use has yet been discovered . . . yet the same was true of others which long since have been "drafted" for important tasks in industry.

Perhaps one of these laboratory compounds may solve an important problem for you. If not . . . tell us your requirements and perhaps we can produce one that will. Our research staff will gladly co-operate with you.

VICTOR Chemicals
(In Commercial Production)

Phosphoric Acid
Pyrophosphoric Acid
Polyphosphoric Acid
Phosphorus
Phosphorus Oxychloride
Phosphorus Trichloride
Phosphoric Anhydride
Alkyl Acid Orthophosphates
Ammonium Phosphates
Alkyl Ammonium Phosphates
Fireproofing Compounds
Calcium Phosphates
Magnesium Phosphates
Potassium Phosphates
Sodium Phosphates
Sodium Pyrophosphates
Potassium Pyrophosphate
Alkyl Acid Pyrophosphates
Formic Acid
Aluminum Formate
Sodium Formate
Sodium Boroformate
Oxalic Acid
Calcium Oxalate
Sodium Oxalate
Magnesium Sulphate
Sodium Aluminum Sulphate
Ferrophosphorus

VICTOR CHEMICAL WORKS

HEADQUARTERS FOR PHOSPHATES • FORMATES • OXALATES

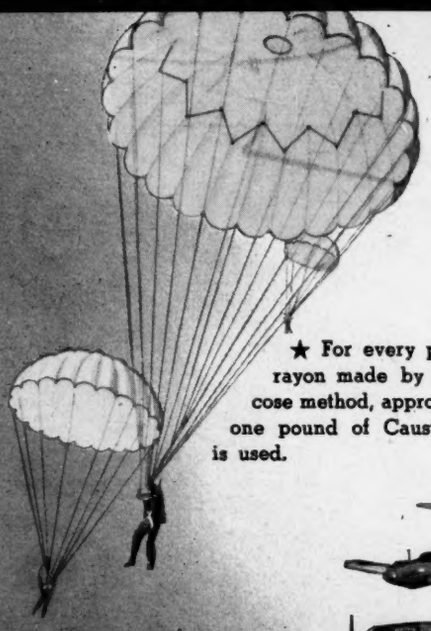
141 West Jackson Boulevard **Chicago, Illinois**

ARMY E NAVY

Open for Public Inspection. Exhibit of the Victor Chemical Works at the Museum of Science and Industry, Jackson Park, Chicago . . . showing the manufacture of phosphorus and phosphoric acid and many of their industrial applications. A unique miniature plant complete with action models.

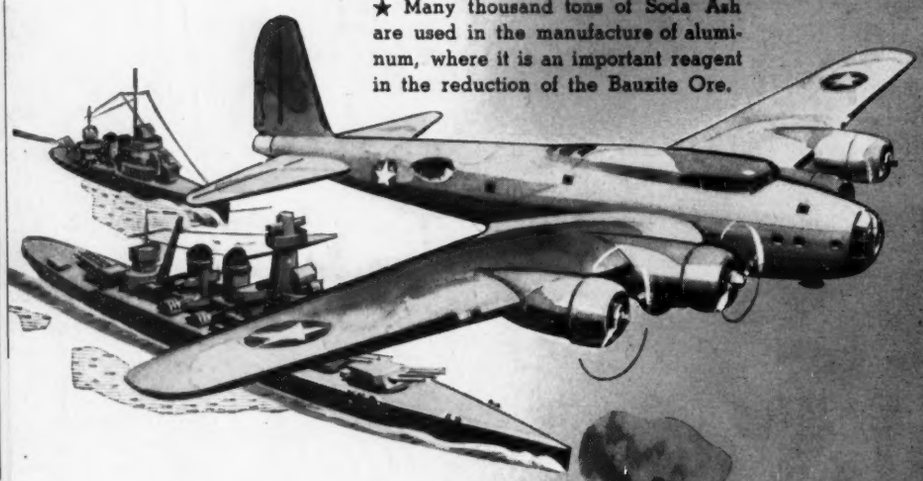
DIAMOND PRODUCTS

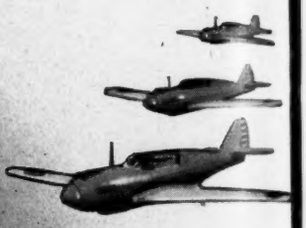
GO TO WAR



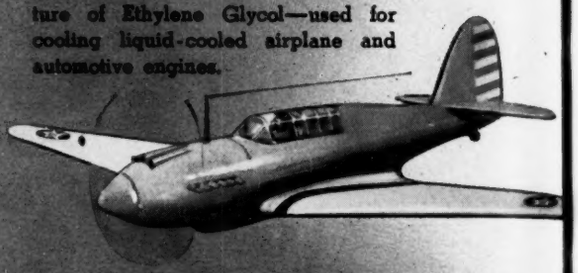
★ For every pound of rayon made by the viscose method, approximately one pound of Caustic Soda is used.

★ Many thousand tons of Soda Ash are used in the manufacture of aluminum, where it is an important reagent in the reduction of the Bauxite Ore.

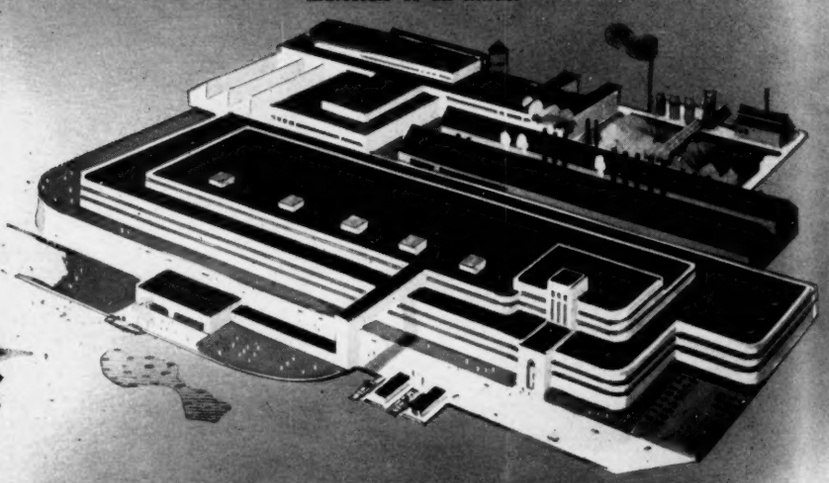




★ Chlorine enters into the manufacture of Ethylene Glycol—used for cooling liquid-cooled airplane and automotive engines.



★ In munitions factories, synthetic solvents made from Chlorine and Alkali Cleaners are used to clean metal parts faster, thus speeding the production of war materials of all kinds.



★ Caustic Soda is used in making soap, of which Glycerine, used in explosives, is a by-product.

★ The manufacture of TNT used in bombs and shells requires Soda Ash in one step of the process.

Peacetime uses for Diamond Alkalies give way to War Requirements . . .

Today the war effort comes first with Diamond, as it does with you. Shown here are a few of the intensified, war-inspired applications for Diamond products that must be satisfied before civilian uses can be served.

When every ounce of effort is devoted to the one job of winning the war, maximum production must be maintained without sacrificing quality. Diamond is meeting this challenge!

ALKALI

DIAMOND ALKALI CO., PITTSBURGH, PA., and Everywhere

DESIGN FOR VICTORY

Closer Management Control of Production Activities

Increased Utilization of Time-Saving Laboratory Devices

Conservation and Salvage of Vital War Materials

Development of Substitute and Replacement Products

Upon the broad and willing shoulders of the American Chemical Industry rests much of the fate of this country and its Allies. Basic chemicals are the backbone of practically all present-day industrial manufacturing operations. Only a super-human effort on the part of the makers of chemicals will assure ultimate victory. The editors of Chemical Industries as their contribution to the all-out war program present a group of representative articles designed to assist plant management in the solution of four of the most pressing problems facing it in this grave national emergency.

PLANT OPERATION AND MANAGEMENT

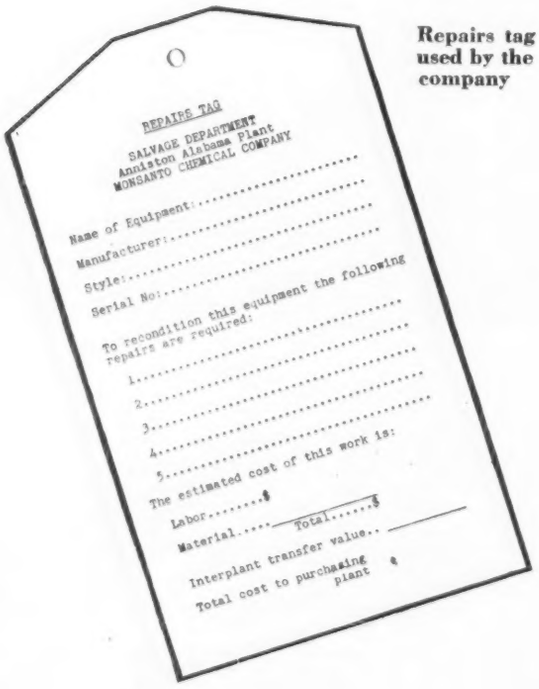
a conservation plan for

By George A. Yocum, *General Engineering Department, Monsanto Chemical Company*

WITH Donald Nelson's recent much publicized "Emergency Statement to Industrial Executives," conservation of materials and machines officially became second only to production as top ruling consideration in the country's industrial war effort. To most engineers and industrial managers who have given the subject any serious study, this came as belated recognition of one of our richest and least exploited national resources—the industrial scrap heaps and used equipment stores.

Chemical industry has perhaps been quicker than other industries to see the economy of utilizing scrap materials and so-called industrial wastes. Because it is by nature a conversion rather than a fabricating industry, and because utilization of scrap and waste is primarily a conversion job, it has probably enjoyed at least a psychological advantage in this direction. However, when it comes to making use of used equipment, this writer's observations have indicated that it still has something to learn.

To the casual observer chemical industry most likely seems to be doing a reasonably efficient job of putting salvagable equipment to work.


REPAIRS TAG

SALVAGE DEPARTMENT
Anniston Alabama Plant
MONSANTO CHEMICAL COMPANY

Name of Equipment:.....
Manufacturer:.....
Style:.....
Serial No:.....

To recondition this equipment the following repairs are required:

1.....
2.....
3.....
4.....
5.....

The estimated cost of this work is:

Labor.....$ Total.....$
Material.....

Interplant transfer value..
Total cost to purchasing plant $

Repairs tag used by the company

The relatively frequent necessity for process alterations, especially where organic products are involved, plus the fact that chemical equipment has reached the point where much of it is interchangeable, has resulted in much reuse of equipment. If the amount being done is viewed in relation to the opportunities, however, the writer believes that for the majority of the industry it would not be unusually impressive.

Today the case of salvage is one of conservation of time as well as materials. Indeed, time may be even the more important of the two. Few are the production executives who can boast of never having been delayed by late delivery of a machine or piece of equipment. And finally, there are the money savings and operating economies that usually can be realized from a well planned and well administered conservation program. These are additional bonuses in these times.

It was primarily with the present emergency in mind, but also with the hope that permanent benefit would result, that Monsanto Chemical Company developed and put into operation last year an organized inter-plant conservation program. Administered from the General Engineering Department at company headquarters in St. Louis, the program includes all of the Monsanto domestic plants. Formerly conservation had been an individual plant responsibility. One of the aims of the centralization move was to fix responsibility for conditioning the salvaged equipment and to set up some general standards on which to judge its value, thus hoping to dispel the suspicion with which planning and maintenance engineers had been inclined to view all used equipment.

In putting the program into operation the first step consisted of going over all used equipment and placing it in one of the three following classifications:

1. *Scrap.* To be sold by purchasing department.
2. *Surplus Equipment.* To be listed for sale to company's other plants.
3. *Machinery Stores.* To be carried by storekeeper at reduced value.

The next step involved assembling of necessary data to compile a complete catalog of items of surplus equipment in the thirteen domestic plants of the company. This was accomplished through the cooperation of various plant managers. The items were assigned catalog numbers denoting the plant at which the equipment was located, the year in which it was purchased, its condition, plant equipment number, and the type of equipment. Each catalog number was accompanied by a brief description of the item, including such information as name of manufacturer, capacity, purchase cost, sale price, and approximate shipping weight. The catalog was mimeographed and furnished to all plant managers, plant engineers, and divisional purchasing departments. It is kept up to date by issuing a revised edition monthly. All correspondence relating to items listed in the catalog is handled through a clearing house located in the main office in St. Louis.

The original intent was that the clearing house or a central salvage department should have charge of salvage operations in all plants, but to save time it was decided that each plant would operate its own department along the lines recommended by the salvage clearing house. The procedure followed by these plant departments is shown in the accompanying diagram.

One problem worthy of mention which sometimes comes up is that of classification of salvagable obsolete equipment. Is it usually entirely a matter of discretion as to whether or not such equipment is worth dismantling and cleaning up? If it is decided that it is, however, there is the question of availability of repair parts should it be put into service. In general it has been found worth while to determine at once whether such parts are available before any reconditioning work is done on the equipment.

Each plant provides sufficient space to carry on the salvage operations. This includes yard space, building space, and necessary equipment, handling tools and supplies for the work.

The salvage department, depending upon the plant, varies in size, but in each case it is supervised by responsible personnel. It was found that best results are obtained when it is operated by a good mechanic with adequate mechanical assistance. Clerical work is handled by the plant stores department. Those items which are salvaged and retained for machinery stores are turned directly back into the stores account, and items of surplus equipment are carried in a special used equipment account.

Referring again to the accounting for

salvage equipment, those items which have been fully depreciated may accrue charges for salvaging operations. These charges would then represent the total value on Monsanto's books, and the item could be transferred from plant to plant at this value. However, if it desires, the plant at which the transfer originates may place its own value on the equipment. Also, the price listed does not necessarily remain the same for a sale outside the Monsanto organization, but is set to conform with those of the trade.

After carrying an item for six months in the catalog with no response, it is considered to be of no further use to Monsanto.

Permission is then obtained from the plant owning the item to sell it to the "outside." A complete new catalog is issued to be circularized to used equipment dealers and other interested parties. When the clearing house finds a customer, he is referred to the purchasing department of the plant selling the equipment for consummation of the sale.

Monsanto's operations have not been devoted entirely to the handling and reclamation of equipment, but include the recovery of old pipe covering, ground cork, used fire brick, crank case oil, waste paper, scrap iron, copper tubing, steel sheets, and many other articles of comparable value.

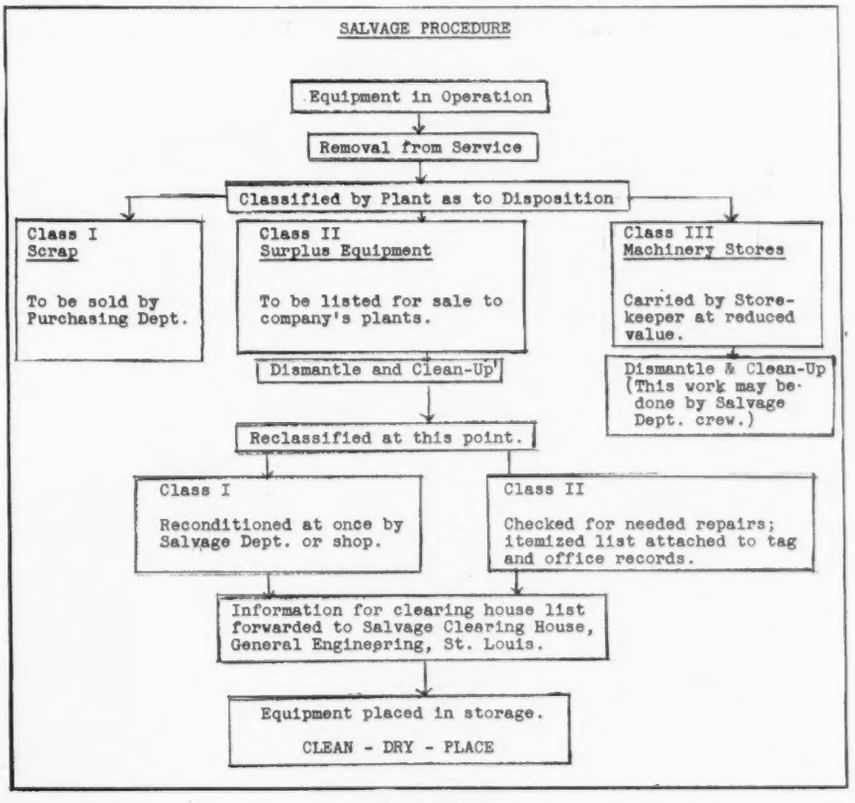
During the first six months of operation, the listings of the salvage clearing house have increased from 37 items to 237 items, representing a total cost valuation of approximately $125,000.00. There have been 42 inter-plant transfers and withdrawals, amounting to $28,000.00 valuation (new cost). The amount of waste and scrap sold has amounted to approximately $18,000.00. Several thousands of dollars worth of salvaged goods have been placed back in the machinery stores account.

The foregoing has been essentially a presentation of a method—the mechanics, more or less—for carrying out an industrial conservation program, primarily as applied to equipment. That the method has met with some measure of success is indicated by the results of the first six months.

However, it became evident very early in the administration of this program that more than a method or system was necessary to achieve satisfactory results. The program had to be sold and merchandised to those responsible for it at each individual plant. A "conservation consciousness" had to be created. No system, however perfect, can succeed if it isn't used. For this reason a member of the Monsanto Central Engineering Department spent several weeks visiting all of the company plants as literally a conservation "sales and service" man. The most difficult problem encountered by this traveling emissary was to steer local plant management away from the tendency to hang on to things for which they had no immediate use in view. The policy of "use it or get rid of it" was not easy to sell. The nationwide salvage drive now being conducted by the War Production Board has helped recently. However, even without this patriotic appeal the policy would seem to have intrinsic merit, for all too often does the philosophy "It may come in handy someday" turn out to mean storing forever.

There is also the problem of responsibility in carrying out a conservation program, especially when a central body without authority over plant operations is placed in the administrative position. As already mentioned, the Central Engineering Department is the administrator of the program at Monsanto. Obviously there are times when engineering and production will not agree in certain matters pertaining to salvage. Production may say a salvaged item is no good or won't work, while engineering says it will. Such disputes are settled by production and engineering putting their heads together to see what can be done. Sometimes the trouble is that production has not installed or operated the reconditioned item properly. Sometimes the equipment actually won't work under the conditions at hand, in which case it is either turned over to scrap or offered for outside sale.

Usually, general policy on responsibility for using reconditioned items will fall somewhere between two extremes. On the one side, general management can issue an order that no new piece of equipment can be purchased without first exhausting every possibility for use of a reconditioned item. Such a course is indeed a challenge to engineering skill. Or, there is the other extreme of never using a reconditioned item unless a new one is not available. Monsanto has found a course about midway between these two to be most effective from the standpoint of both conservation and sustained production.

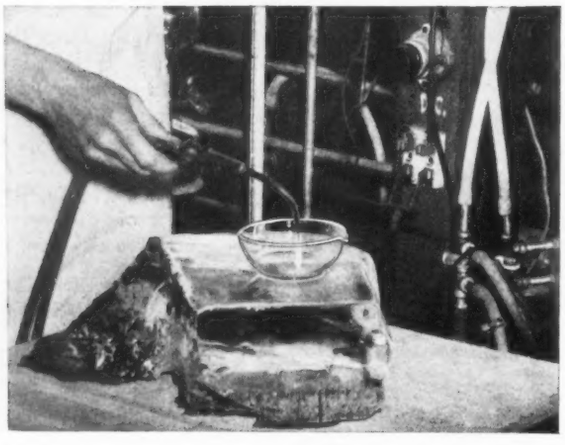


Flow Chart

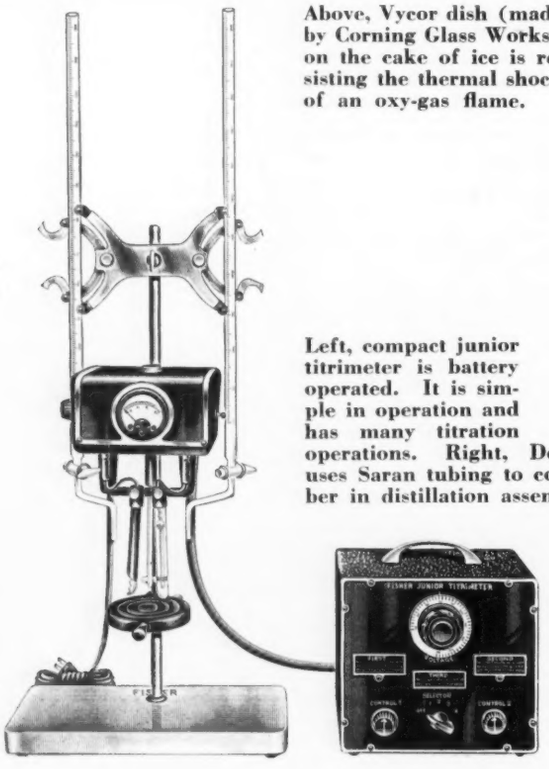
The Fisher improved mortar grinder does away with the long manual grind, works efficiently and automatically.

By William B. Warren and Howard Draving *

The apparatus and instrument industry also has been influenced by the present tempo of increased production. Here is a review of the achievements of the apparatus maker in recent months. Here, too, are all the latest tools to help the laboratorian save time, save money and do a better job. Conservation of metals and rubber is a main factor.



Above, Vycor dish (made by Corning Glass Works) on the cake of ice is resisting the thermal shock of an oxy-gas flame.



Left, compact junior titrimeter is battery operated. It is simple in operation and has many titration operations. Right, Dow chemist uses Saran tubing to conserve rubber in distillation assembly.

THE war tempo of increased production which has enabled the chemical industry to provide "two instead of one, and one where none existed before" also has accelerated developments to a marked degree in the apparatus and instrument industry.

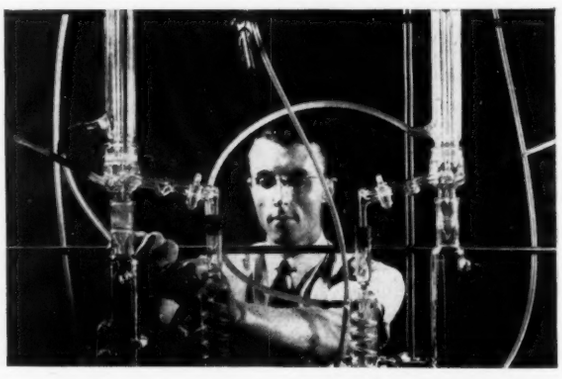
Men of science have at their command today an imposing array of laboratory tools, amazingly diversified and highly specialized to meet the most individual needs. In this War of Supply, the chemist's work depends to a large degree on the availability of these every-day needs as well as on the design and manufacture of new apparatus. A new instrument is as pregnant of possibilities in the laboratory as a faster welding technique is on the assembly line.

The chemists of America have long been alert to new techniques and apparatus—eager to incorporate, to adapt, and to benefit from the research achievements of the apparatus maker. Thus, the developments since the last report† will be of unusual interest to the laboratorian.

The extent to which instrumentation

* *Director of Development and Advertising Manager, respectively, Fisher Scientific Company.*

† *Chemical Industries, December, 1939.*



Recent Developments in Laboratory APPARATUS and INSTRUMENTS

Making a reading with Fisher refractometer requires less than a minute. Sample for liquid prism is but a small drop.

has entered the laboratory, and in particular the industrial laboratory, is reflected by the increasing number of schools and colleges which now offer courses in the manipulation and use of instruments and apparatus. The journal "Instruments" lists one hundred and eleven institutions in which courses of this type are now offered. Typical courses are Instrumental Analysis, Physical Measurements, Physico-chemical Measurements, and Paper Testing and Analysis. Recently, a considerable demand for workers skilled in the use of instruments and apparatus in the war industries has resulted in the offering of short courses in many of the colleges. The University of Pittsburgh offers such a course in Industrial Spectrographic Analysis.

The tools developed in recent months range in breadth of application from Pyrex watch glasses to a new Ayrton-type shunt of particular use with galvanometers they are all similar in that they enable the laboratorian to save time, save money, or help him do a better job. Of considerable importance as stopgaps and of potentially prime usefulness are the new materials devised to conserve strategic metals and rubber.

Spectroscopy, long the pursuit of the pure scientist, has of late emerged in shirt sleeves. The tempo of modern industrial production is such that the orthodox methods are entirely too slow and the spectroscope has stepped in with marked success. In the metallurgical industries and in those which utilize large amounts of metal, this is particularly noticeable. One producer of light metals presents samples to the spectrographic crews at the rate of one a minute! The procedure is highly refined and each crew member works according to a definite schedule and procedure.

This demand for ever greater speed has quite naturally resulted in the appearance of better equipment. Among new spectrographs are those of Dietert-ARL, Baird, Gaertner and Bausch & Lomb. Of equal importance in spectrographic analysis is the densitometer with which the photographic plates are analyzed. Improved densitometers have been made available by Dietert, Baird Associates, and Leeds and Northrup. Some are designed for direct reading through photoelectric measurement and others, notably the L. & N., are recording. Accessories which assist in the process are a press for briquetting granular samples and a rapid film washer and speedy film dryer by Dietert.

Ainsworth recently introduced a micro balance which meets all the requirements outlined by Pregl and completes a line of micro apparatus that American supply houses have been developing and perfecting for 25 years. While European scientists introduced micro chemistry, American chemists have had the advantage of better tools and have gone forward where the foreign chemists left off. The new balance is sensitive to one thousandth of a milligram and is unique among micro balances because of its ease of operation.

Said to be radically new in principle is the structure of the Thompson analytical balance in which the familiar pillar is absent and only the beam, pans and pointer appear inside the case. The beam is mounted on an arm which projects outward from a panel which divides the back of the case and which also contains the pan and beam arrest mechanisms in such a way that they are well protected, yet readily accessible.

Electrometric titration, now widely em-

Author's Note

This survey, while lengthy, is by no means complete and is not intended to be so. Rather the attempt has been to indicate the intense activity in all the broad field of instrumentation development during a short period.

A word of caution is in order. The war has had its effect on the instrument maker as well as on everyone else. Some items described may no longer be available, others may have undergone change. High priorities are required in many cases, other items are readily available. It is best to allow more time for delivery. Anticipate your needs and investigate the priorities to which you are entitled.

Uniform temperature throughout the Fisher Isotemp Oven is maintained; samples do not have to be removed from one shelf to another.

ployed although it has been in routine use for less than five years, can now be adopted in laboratories without 110 volt A.C., and in the field. This is possible by use of the Fisher Junior Titrimeter which operates from dry batteries and employs an indicating meter to measure the exact end point. Increased accuracy and freedom from the human factor in conducting titrations characterize the operation of this new model as well as that of the more versatile Senior Titrimeter with its electron ray tube (magic eye).

A new series of polarizing microscopes offered by Spencer is said to possess features of advantage in the analysis of materials under polarized light. Some fields where this instrument have been applied are petrography, mining, medicine, paper, textiles and food and drug manufacture.

The polarimeter, a standard instrument in the sugar industry, has also received attention from Spencer. Their new half shade instrument employing polaroid in the place of expensive nicol prisms is versatile and inexpensive and particularly well adapted to educational and industrial work where a reading to one-tenth degree on the scale will suffice.

Especially exciting was the advent of the electron microscope. This instrument extended to a new order of magnitude the range of human vision. Best optical microscopes fail at 2000 diameters, while the electron microscope starts at 1500 diameters and can go as high as 30,000 diameters. By photographic enlargement the useful magnification can be further extended to 100,000 diameters. It is particularly interesting to note that a large proportion of all the instruments installed to date have gone, not into the cloistered halls of pure science, but into the research laboratories of industry. One of the first was set up in the laboratory of a large plastic industry.

Several new and useful heating devices are now available. One is the Autemp Heater, a 6-inch, electrically-operated hot plate that has thermostate control and is much more sturdily constructed than previous "breakfast table" heaters. Another is the Fisher Infra-Rediator which employs infra red lamps to hasten evaporations (without spattering) and filter paper ignitions (without flame). Two dishes or as many as 14 filter papers can be heated from above and below simultaneously. A third new heating device is the Hotspotter. It has a 1-inch heating coil enclosed in a refractory and is mounted for attaching to a support stand. A rheostat permits control from gentle warmth to intense heat for heating small beakers, condenser assemblies, small extractors, etc.

Electric head also is employed in the improved Fisher Hot Wire Cutter by means of which glass tubing can be cut evenly and without danger. A nick or groove cut in the tubing with a file is placed on the red hot wire and a neat fracture is produced.

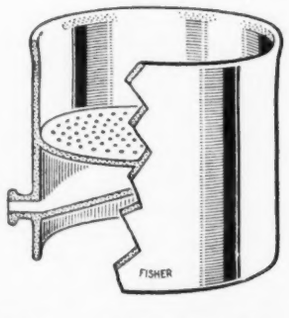
Temperature control by means of sensitive thermometer elements which make and break an electric circuit between the mercury in the thermometer and a control contact, either fused in place or adjustable, are available from Brabender, Electric Glass, and from Philadelphia Thermometer. A bimetallic type thermoregulator capable of interrupting as much as ten amperes AC, of rugged design and reasonable sensitivity is that of Fenwal. A simplified and rugged Beckman Type Thermometer, easy to set, with a five degree C range and readable to one thousandth of a degree C is that of Philadelphia Thermometer. An interesting thermometer with two bulbs in series below a single capillary is employed to obtain measurements of "effective temperature" a quantity of significance in air conditioning control. Because one of the bulbs is wet and the other dry, the combined effects of temperature, humidity, and circulation are said to be measured by the instrument which is called Therhumiter. It is made by Weksler. The temperatures of surfaces may readily be measured with Tempils and Tempilstiks. These are made up in definite melting points and the pills are placed on the surfaces, while the sticks are used like a crayon to make a mark which melts sharply at the indicated temperature.

The condition of machined surfaces, the roughness of paint films, and the like are measured and recorded by the Brush Surface Analyzer and measured by the Profilometer of Physicists Research.

Industry has found myriad uses for low temperatures and the laboratory in turn has profited by the availability for its own use of such low temperature cabinets as those of Jewett, Kold-Hold, and Mobile, some of which hold temperatures as low as minus 100 degrees F. to plus or minus one degree F.

In any laboratory where electrical instruments are used or where electric current must be controlled, the rheostat is a familiar element. Where alternating current is available, the Voltrol, a continuously variable auto-transformer is a particularly convenient alternative. Any voltage between 0 and 135 volts is instantly available and, of course, no current is wasted by being thrown away as heat.

Corning's productive research program has made several major advances in laboratory glassware resulting in additions to the line of Pyrex brand glassware. Just as Pyrex itself was a major contribution resulting from World War I, the removal of foreign sources in this conflict plus a progressive policy has brought the chemist American-made fritted ware and a far superior brand of heat-resistant glass called Vycor. Pyrex Fritted Ware replaces the imported Jena product while Vycor is an entirely new line which ap-



Familiar and efficient Buechner funnel with a substantial support.

proaches quartz in its physical properties.

Pyrex Fritted Ware (gooch crucibles, dispersion tubes, funnels, etc.) are notably free from chemical attack.

Revolutionary Glass

Vycor is a 96 per cent silica glass which is processed by a method that is said to be the only real innovation in glass making in 4,000 years. The new glass has such a low coefficient of expansion (0.0000008 per ° C.) that a six-mile length of it would expand only 8 millimeters (1/3 inch) for each degree of temperature increase. The import of Vycor to the laboratory is immediately apparent but the commercial applications are at present as obscure as they are full of potential usefulness. Corning also has made available a line of actinic glassware and alkali-resistant (boron free) glassware as well as much-needed Pyrex beaker covers.

Another familiar apparatus line—Castaloy Laboratory Appliances—has a 22nd member in the form of a Pinchcock and a 23rd, a Leveline Bulb Support. These additions to the series of clamps, holders and supports is unique in that the pinchcock provides straight-line action and slips on tubing at any point; the support permits close control of bulb level.

Gas analysis continues to receive the efforts of the instrument maker. With increasingly higher pressures being employed in the steam power plants of the nation, oxygen dissolved in the boiler feed water becomes a greater corrosion hazard and must be kept to very low concentrations. The dissolved oxygen recorder of Cambridge can measure to one part in 400,000,000.

Oxygen in other gases in the concentration range from 0 to 20.8 per cent. is measured and recorded by the MSA Oxygen Recorder. The same manufacturer makes the MSA Carbon Monoxide Indicator for detection of this hazardous gas in the range 0 to 1.15 per cent, in air.

Carbon dioxide in flue gas is determined by the Englehard Flualizer and Bacharach Fyrite in order to promote more economical operation of steam boilers.

Hardness of solids is measured by the Dynamic Hardness Tester of Ferner and by the Impressor of Barber-Coleman, while the Taber Abraser determines the resistance of surface finishes to abrasion.

Moisture content of solids is determined electrically, with the Tag-Heppenstall Tag, Moisture Register, and Hart Moisture meters, while samples are quickly dried for moisture determination by the Dietert Moisture Teller. A more elaborate setup for determination of moisture content which combines the drying oven and balance in one semi-automatic instrument is that of Braebender. Moisture content of gases in high pressure systems may be determined with the Bureau of Mines Type Dew Point Tester made by Refinery Supply.

Specific Gravity of liquids may be continuously measured in open or closed vats, in pipes and in tanks by the Ashcraft Electric Hydrometer, while the Recording Viscosimeter and Specific Gravity Meter of Petroleum Instrument Corporation yields a continuous record of these two factors in many fluids. For the rapid determination of the specific gravity of solids, Baird Associates in cooperation with Roller-Smith have produced a Berman Type density balance. Specific gravity of gases is continuously recorded by the AC-ME Recording Gravitometer of Refinery Supply.

Further Simplified

Colorimetric analysis is further simplified by the completely redesigned Fisher Electrophotometer which incorporates A.C. operation for the first time and reduces the technique to extremely simple steps. This method of analysis is expected to become even more widely used now that the human factor in judging color is completely eliminated and the procedure is no more complicated than tuning in a radio.

The spectrophotometer of Beckman, Cenco, and Coleman promise to extend the usefulness of Colorimetric analysis. Fluorescence analysis, especially useful in vitamin determinations, has resulted in the appearance of instruments by Pfaltz & Bauer, Coleman, Photovolt, and Klett. Vitamin B, assay by fermentation has been facilitated by equipment produced by American Instrument.

The buffer and refractive index sets of Cargille are a real convenience to the busy laboratorian.

"Set to touch" and "Tack free" times of paints are measured and recorded by the Gardiner Drying Time Recorder. Samples of the paint on a panel are drawn under toothed wheels at a definite rate and the impression of the teeth is interpreted in terms of these expressions.

For experimentation with ultrasonic waves is the "Ultrason" of Televiso. This is an instrument employing an oscillating circuit and a piezoelectric crystal and with it frequencies as high as two megacycles are obtainable with 215 watts input resulting in 85 watts ultrasonic output at 400 kilocycles.

Inexpensive ovens with temperature regulation have been devised by Precision and Fisher. The Precision Utility No. 16 employs a hydraulic thermostat, adjustable ventilation shutter and safety features with an 11" x 11" x 11" working chamber. The Fisher Isotemp Oven features exceptional uniformity of temperature throughout, the 12" x 12" x 12½" working chamber, sealed capsule thermostat safety door release and large, usable shelf space. Both these new ovens have advantages not usually found except in more expensive types with forced ventilation.

Coors has announced two innovations in porcelain ware—Mullite Mortars and a redesigned Buechner filter. The material mullite (silicate of alumina) is harder than agate anud, therefore, a superior substitute for this scarce material. Mullite mortars resist abrasive action in mechanical grinders and are available in four sizes. The Buechner Filter stand is of all-porcelain construction and is used like an ordinary Buechner funnel; is more stable because it rests directly on the work bench.

Another new filtering aid is the Fisher Filtrator, a major improvement over the conventional vacuum filter assembly. The Filtrator combines the support stand, vacuum chamber and funnel in a compact unit which can be connected to or disconnected from a series without interfering with the other units. The unique, double-walled porcelain funnel has inside slits that speed up filtering to a marked degree. The Filtrator is particularly adapted to quantitative work since both precipitate and filtrate are collected, and the filtrate need not be transferred for subsequent operations.

Automatic Control

Automatic control of electrical switches and automatic counting by photocell impulses are provided by the Fisher Electronic Relay. The apparatus consists of control box, photocell unit, lamp unit and counter which can be connected to control such apparatus as water baths and special research setups. When the counting assembly is used, it is possible to obtain a count of any operation or occurrence that can be made to intercept the light directed against the photocell unit.

For determination of the amount of carbon residue in petroleum products the Tag ASTM Ramsbottom Carbon Residue Apparatus subjects the samples in stainless steel coking bulbs to a temperature of 1020 degrees F.

Testing of balloon fabrics is assisted by the Fabric Permeameter of Cambridge. Diffusion of the gas through the fabric changes the thermal conductivity of gas on the other side and this in turn is measured electrically.

Capacitance coupling in conjunction with the "Radio Principle" employed in its controllers enables the Wheelco Remote Controller to detect the level of liquids in tubes of glass. This is of value in automatic level control as well as in the measurement of pressure through manometric means.

For sulfur determination in organic materials by the quartz tube combustion

method, the "Braun Shell Design Sulphur Determination Apparatus" is available. It is said to be rapid and accurate.

The difficult task of measuring the thickness of rubber and other compressible materials is simplified by the Carson Rubber Micrometer made by Instrument Specialties. Contact pressure is eliminated and an electronic detector enables measurements to be made to five one hundred thousandths of an inch.

Aerosol and similar wetting agents have been put to numerous uses by chemists since they have been made available in small quantities. Aerosol packaged by Eimer and Amend "makes water wetter" by reducing surface tension; it has novel and practical uses in photography, washing glassware, hastening dissolving action, aiding penetration, etc.

The Fisher Refractometer is the first inexpensive apparatus to be made available for refractive index measurements. It has a range of N=1.30 to N=1.90, and a sensitivity of N=.002. Features of the instrument are its convenience of use, small size of sample required (0.001 ml.) and the rapidity of measurements (less than a minute). The readings made by this instrument and the determination of specific gravity by means of the Fisher-Davidson Gravitometer will enable the organic chemist to identify many compounds. The Gravitometer employs a unique assembly whereby an unknown sample is balanced against a liquid of certified density so that the density of the unknown is read directly in specific gravity units from a graduated scale. The range of the apparatus is 0.60 to 2.0 and readings can be made to the third decimal place.

The Currier Size Tester of Thwing-Albert tests paper for its degree of sizing by measuring the transit of water through the sample by electrical means. Because of the sensitivity of the circuit, distilled water may be used and this is said to provide a rational size test. Heretofore, an electrolyte was required and the results would not necessarily be parallel with those obtained with distilled water.

Continuous indication of corrosivity or stability of water may be obtained with the Enslow Stability Indicator of Phipps and Bird. It is said to have been designed to embody features suggested and developed by practical water works men.

For measuring low pressures in vacuum systems, the Tru-Vac Pirani Type vacuum gage is made by Continental. With this instrument continuous electrical measurement at a reasonable distance is possible.

New Fisher A C model electrophotometer, a standard in colorimetric analysis.

Labor-saving devices again are prominent among the new developments. There is an improved Fisher Mortar Grinder that mechanizes the difficult task of reducing ores, ashes, etc., to powders for analysis, and the Gyrosolver, a motor-driven flask shaker that minimizes the work of dissolving procedures, to name but two examples.

New glassware items include a series of Shock-Proof Condensers which have flexible joints, brass connections and removable jackets. These condensers minimize breakage and facilitate assembly since the couplings can be turned as desired. Chromatographic analysis is simplified by use of Scientific Glass' lines of glass adsorption tubes and Fisher Adsorption Alumina. Corning has recently announced new manometers and flow meters.

The Volustat by Fisher is the first inexpensive dispensing machine. It delivers 48 discharges per minute, is adjustable for identical shots from 0.1 to 5 ml., and has both manual and automatic controls. When the inlet is connected with the liquid to be dispensed and the apparatus is operated on the "continuous" setting, the desired amount of liquid can be added to test tubes, etc., as fast as the operator can move the delivery tube from one receptacle to the next.

Plastic tubing and glass pipe are being used by the chemist primarily to conserve rubber and metals but they have characteristics which it is predicted will gain favor for them in particular uses. Pyrex glass pipe and moulded glass shapes have already come into considerable use while Dow's Saran is a more recent development. Saran sheets, extruded shapes and tubing have unusual properties. The tubing is particularly suited to laboratory use as a substitute for rubber. It can be formed readily and is a means of saving up to 85 per cent. in the rubber required for an apparatus assembly.

Another plastic to return to the laboratory is nylon, now available in test tube and cleaning brushes that outlast by several times those made with ordinary bristles.

Numerous, indeed, are the smaller items that make laboratory work easier or perform their function better than heretofore materials. Several new fluorescent lamps have been made available for titration work, illuminating balances, etc. There is a new sealing cement called Pyseal for making glass joints airtight; also a new Labmotor for stirring, test tube washing, etc., and a safety glass shield to set in front of potentially dangerous glassware assemblies.

All these new tools are but some of the additional items that his tool maker has made available for the chemist within the past three years. There are 10,000 others —and 20,000 chemicals. These stocks of apparatus form a pool from which the laboratorian can draw his requirements. With them and his ingenuity, the American chemist can be expected to help greatly in the struggle for freedom. He has much at stake and the reward is great, for, as Dr. James Bryan Conant, President of Harvard, recently said:

"Progress in science has been made by the unusual person, the unorthodox individual. He cannot survive a regimented social order. It seems to me illogical for a scientist to be even quietly resigned to the possibility of highly organized paternalistic state."

Executive Production Control in Chemical Plants

By W. von Pechmann

Agfa Ansco Division, General Aniline & Film Corporation

Here is a system which will enable executives to control production in an unusually efficient manner. It gives them a summary of exceptions to standard procedures and strips data of un-needed routine.

COPING with the labor shortage in the chemical industries has become a considerable problem. These industries employ many specially skilled workers who can not be trained in vocational trade schools. To train employees quickly, one must resort to more or less indirect means such as simplification of production procedures or intensification of production control. A method has been developed during the past two years which not only facilitates training men more quickly but also makes it possible to work with a staff of employees who have little technical training but who have acquired sufficient manual skill to perform operations according to specific instructions.

The method is based on the belief that a complete standardization of production procedures trains employees more quickly and places the production executive in a position to demand that only reports of deviations be submitted to him. The method supplies the production executive

From top to bottom: Standards are established by management in cooperation with workers; Worker consults a Master Card and enters actual deviations in process; Deviations are transferred to Control Cards; Charts are posted in the executive's office for his instant analysis.

with data stripped of all routine records, with emphasis given only to important deviations so that major changes, errors, and flaws stand out sharply. Supplied with this information, the executive can oversee the entire production process more clearly. This enables him to take decisive action independently of the experience of his staff whenever a change is reported which, in his opinion, calls for his interference.

It should be clearly understood that the analysis of deviations from standard procedures does not apply only to errors which have occurred in production, but also to any change which has taken place since the standards were established. Every factor which is instrumental in bringing about the proper efficiency in production can be controlled by this method. To state some instances:

Materials

Change of manufacturer
Change of shipment
Opening of case within one shipment
Individual batches or solutions made up from one case or barrel

Job Performances

Change of equipment
Change of operators
Change of formulas
Deviations from formulas

Prevailing Rulings

Deviations from any rulings established

General

Deviations from an established labor turnover
Deviations from an established cost per unit.

The description of the method which follows by no means covers all phases which can be controlled but merely states the principles with which one should comply to put this method into effect. Samples will be given covering the control of materials which may just as well be used to control job performances and vice versa.

Establishment of This Method

Introduction.

The entire production process of a day is put in writing. Every factor is considered—materials, operations, and prevailing rulings are included. These findings are termed "relative standards" since they are in no sense rigid or permanent standards, but are merely the result of a complete production survey made at random. See Figure 1.

Relative standards are entered on "Mastercards" which are used by operators and supervisors in connection with working cards. The working cards have the identical layout of a master card but are blank. Employees are instructed to make entries on their working cards only when the operation they perform differs from the master card. Master cards are retained at the place of work; working cards, however, are submitted to the office where entries made are combined into "phases" for convenient further entries.

For every phase to be entered, the executive has pre-established two standards with which the "phases" are compared:

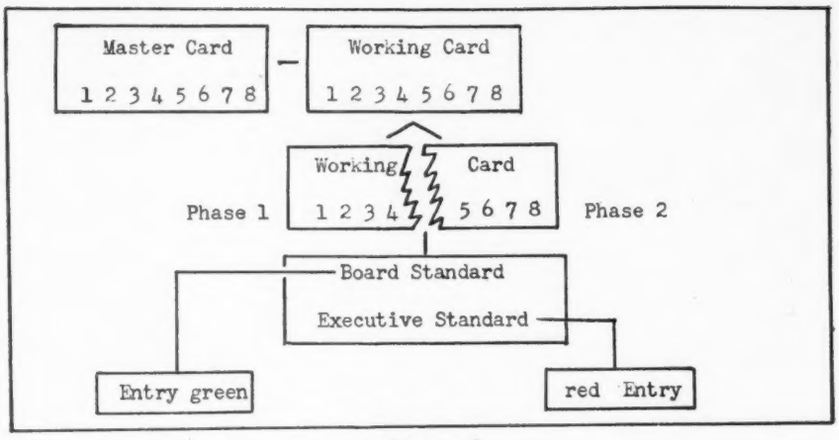


Figure 1

(1) a "Board Standard" indicating changes of lesser importance (entries made in green)

(2) an "Executive Standard" indicating changes of greater importance (entries made in red).

According to the comparison made, the deviations are entered on to a Master control board. Since all variations pertaining to one product have to be separately analyzed, the Master control board constitutes in reality many complete control boards.

Figure 2 shows a section of the Master control board representing one product. On the left hand side of the board are two removable strips showing the Board and Executive Standards (removable strips can be altered without necessitating erasures on the chart itself). The column marked "Ph" on the left margin of the sheet, adjacent to the Board standard, gives the phases. Horizontal lines, therefore, represent phases; vertical lines represent the completed operations which the phases constitute (batches). Thus the phase lines crossing the batch lines form squares which enable the recorder to mark any particular phase of any particular batch. The top line of the chart serves the purpose of indicating the date the batches were manufactured—this information is often essential in making an intelligent analysis.

It can be seen clearly that the control board serves a two-fold purpose: at a glance the production executive is informed of all changes which have taken place within a phase, and he can also trace any changes which have occurred in the manufacture of a batch.

For further expansion of the control board system of exceptions, the department head may report his "Executive Standard" entries to the plant manager, who in turn may want to subdivide all "Executive Standards" forwarded to him into his own Board Standards and "top" Executive Standards.

A. Establishment of Relative Standards and Their Entries on Master Cards.

Relative standards can be established only when there is a complete record of:

a. Materials,
b. Operations,
c. Instructions.

This information can best be obtained by consulting—if available—operation charts, to which is added further information such as temperatures, shipment numbers, etc., used on the day the relative standard is established. In many cases, however, a meeting of the executive with the fore-

1	2	3	4																		
E.S.	B.S.	P.H. #	Product A.																		
			Jan. 15			Jan. 16							Jan. 17						Jan. 18		
		1																			
		2																			
A-M	-a4	3			a 5								a 6				A-B a.1			a 2	
+230 -200	200-209 221-230	4	205			206					205					201				198	
450		5															+50				
		6																			
		7																			
		8																			
Batch #			26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	

Figure 2. Different intensities of color represent different colors actually used on the Master Control Board

men, preferably in the presence of workers who are familiar with the phase of work to be investigated, will also bring helpful results. Employees are simply asked to describe "what they did yesterday." With this information at hand, the production executive draws up an operation chart to which later information not available at the time of discussion may be added.

Relative standards are selected from these operation charts. Whenever it is felt that any change from information given on the operation chart should be made known to the executive,* the information is numbered, described, and called from then on a "relative standard." After instructions have been added on how to enter changes on the working card, the relative standard is ready to be put on the master card.

The numbering of relative standards will logically follow the sequence of operations which employees have to perform.

The description of the standard depends upon the information which has to appear on the control board. If the production executive wishes to be notified not only every time the material and shipment changes but also when another box of a shipment is opened, information pertaining to material, shipment, and box must be given.

Because of limited space on the control board it is often advisable to "code" the description. For instance,

Material:	Potassium Permanganate
Manufacturer:	Merck Chemical Company
Shipment:	No. 1174
Box No.:	No. 4

$A\text{-}M\text{-}a_4$

Figure 3

can be coded as follows:

The key being:

A = Potassium Permanganate
M = Merck Chemical Company
a = First shipment of the year (No. 1174)
4 = Fourth box

Since the relative standard is $A\text{-}M\text{-}a_4$, the operator opening the fifth box will make an entry on the working card as follows: $A\text{-}M\text{-}a_5$. Should the shipment change, the operator will replace the "a" with "b." If the manufacturer changes, he will replace the "M" by the code number of the new manufacturer—and so on. This system, of course, presupposes the numbering of boxes of a shipment with a code number upon their arrival.

The executive may often choose to condense the description when transferring the information from the operating chart on to the master card. For example, an operation consists of many minor tasks; the executive, however, is interested only in knowing that a change has taken place, without wanting to know where it has occurred. In this case, he should combine all tasks into a general description. See Figure 4.

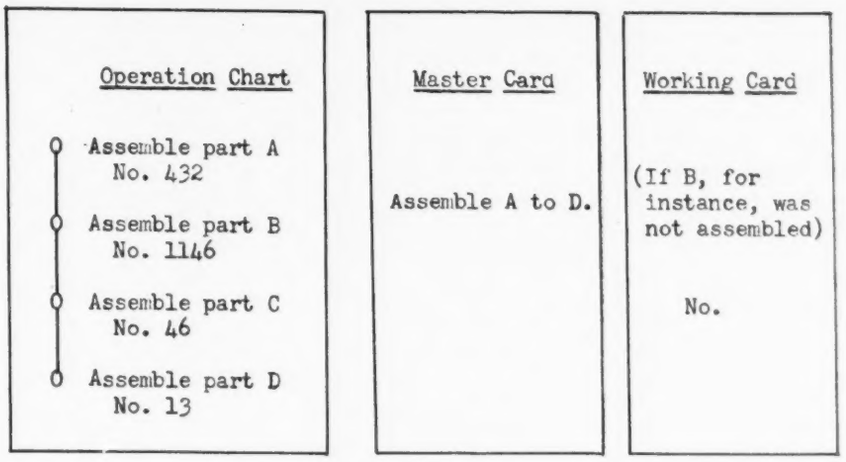


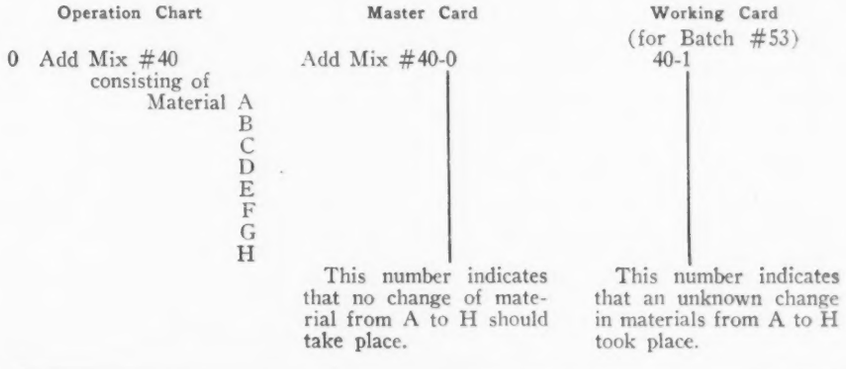
Figure 4

Obviously, only the fact that all parts have not been assembled is of interest to the executive, and the fact alone is reported on the working card.

In order not to overload the production control board with too much information, master cards can also be made up in such a manner that only the fact of a change has to be reported and yet at the same time arrangements made for details to be recorded at the place of work. In case of trouble, the executive simply asks for the "change records." See Figure 5.

Information transferred from the operation charts on to the "master card" may not only be condensed but also elaborated on. Elaboration should be attempted whenever changes are caused by regularly appearing variations beyond anyone's control. For example, it would be wrong to call a weight of 213 lbs. a relative standard if experience has taught that a weight between 210 lbs. and 220 lbs. is the closest one can control. The

Fig. 5



Change Record

for Mix #40

Mix 40	-0	-1	-2	-3
Material:	Batch 42	Batch 53	Batch 70	Batch 89
A	General EL 4621			
B	Allis Chal. 45			
C	" " 46			
D	" " 73	73		Crane A 465
E	Westingh. 1112			
F	" " 1176			
G	Miller Co 3489		3490	
H	" " 1742			

Change can be found by consulting the column of the change record which corresponds with the working card (40-1).

* Mention is called to the fact that occasionally a change, although it does not necessitate executive action, should nevertheless be reported on the control board. Sometimes the single appearance of a change is of little importance, but the continuous repetition of this change may call for executive action.

Minutes	Jacket	Kettle
30'	42°	-
35'	45°	35°
40'	49°	38°
45'	50°	41°
50'	50°	43°
55'	46°	45°
60'	46°	45°

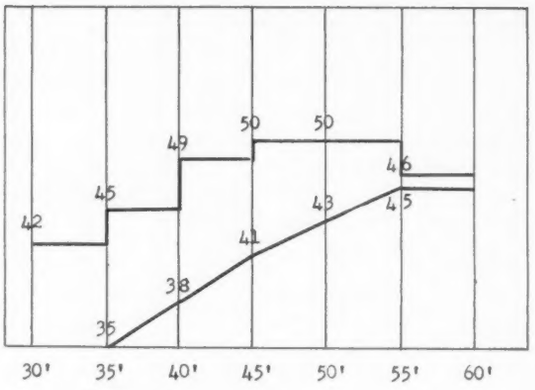


Figure 6

entry on the master card should read: "From 210 lbs. to 220 lbs." by which operators are instructed to report on the working card only the weights which are below 210 lbs. and above 220 lbs.

The notification on master cards regarding changes to be recorded on working cards is simple if this rule is followed: State on working cards only the change which has occurred. The two exceptions to this rule are:

(a) if codes are used, repeat also the factors which have not changed (e. g., if the master card reads "M-M-a_4" and a change occurs in the second letter, the whole code should be repeated, "M-B-a_4," since the location of the symbol within the code is necessary)

(b) if instructions on the master card are underlined, changes are to be recorded by a simple "No" (as on page 6).

B. Master Cards.

It is well to keep in mind that the words "master cards" ought not to be taken too literally. Their layouts may vary considerably from the familiar "card"—depending upon their purpose and upon the best way of making instructions clear to operators. In certain instances, a layout may be chosen for its psychological effect. Master cards, it will be seen, may assume the form of cards, notebooks, or graphs.

Cards are most successfully used for simple operations. Operators are given boards on which master cards and working cards are placed side by side to facilitate entries.

Notebooks are particularly appropriate when foremen have to supervise numerous operations. Regulations can be listed on separate pages and numbered. The corresponding working cards for this type of master card will be plain sheets of paper on which exceptions are recorded.

Instead of having a great number of figures appear on a card—which may be confusing—it is sometimes advisable to present them in the form of a graph. Experience shows, too, that operators do not resent the use of this form of master card. As a matter of fact, operators who previously objected to the introduction o ordinary master cards willingly accepted graphs for master cards. The above comparison illustrates the simplicity of the graph. (Figure 6.)

Greater economy and simplicity are achieved if master cards are designed to accompany material from one operation to the next as far as possible.

C. Working Card.

Very little remains to be said regarding working cards since they are practically facsimiles of master cards; whereas relative standards appear on the master card, corresponding spaces on the working card are left blank for future entries of changes.*

D. Establishment of Phases.

After working cards are submitted to the office, the entries made on them are combined into phases. The primary purpose of phases is to combine standards so that changes within closely related operations can be readily seen; for, to appreciate the full value of a change, it is often necessary to know its relation to another closely allied factor. To take one example among many, consider the relation of time to temperature.

When no combination of entries on working cards is made, the following lengthy and disjointed record is the result:

Exec. St.	Board St.
40°	
	10'

40
10

Figure 7

On the other hand, when a combination is made, the significant relationship is presented concisely:

Exec. St.	Board St.
40°	10'

40/10

Figure 8

E. Establishment of Executive and Board Standards.

Relative standards are posted on removable strips beside the production control board to allow a comparison between a change entered on the board and the standard established. It has been found advisable to split these relative standards appearing beside the control board into two groups. Relative standards which are so important that exceptions to them occurring in production may necessitate immediate executive action are posted on one strip and called *Executive Standards.* All remaining standards are put on the second strip and classified as *Board Standards.*

Occasionally it is necessary to divide one relative standard itself into two groups. This should be done when changes within this relative standard are of unequal importance to the executive. For example:

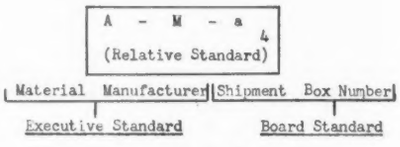


Figure 9

Executive action is required only when changes occur in material or manufacturer.

Although the executive and board standards may be termed "classified" relative standards, it is not always advisable to transfer the relative standards in their original form on to the Executive or Board standard strips for this reason: it is not always possible to foretell whether an anticipated change will belong to a board or an executive standard. In such cases, limits have to be set on the Board standard, beyond which a change violates the Executive standard. See Figure 10.

F. Entries on the Production Board.

The office is the "clearing house" for all working cards from which recorded exceptions are transferred on to the control boards. Information can be directly transmitted from cards to the boards, although it is sometimes advisable to insert an elimination process to facilitate analy-

* When both an Executive and Board Standard occur within one entry, the color of the Executive Standard is used.

Relative Standard	Board Standard	Executive Standard
210–220	200–240	under 200 over 240

Figure 10

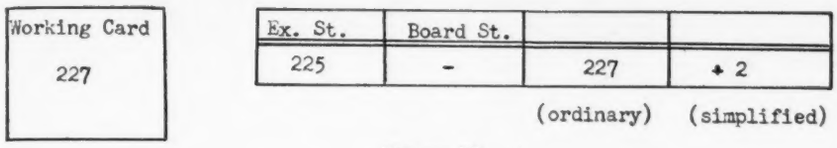


Figure 11

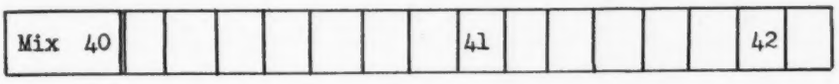


Figure 12

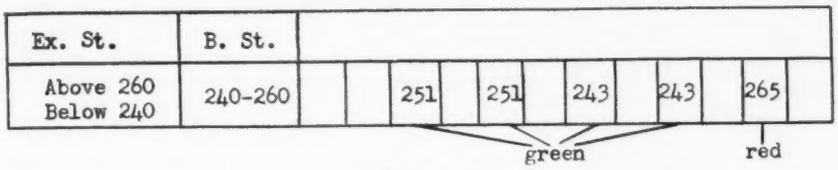


Figure 13

sis. A comparison of an ordinary entry with a simplified entry as in Figure 11.

Changes which occur in production belong to one of these two types:

A. "Permanent" change
B. "Exception" change.

A "permanent" change is one which prevails for some time after its initial appearance, remaining until replaced by another change. This type of change is entered only the first time it is reported since it would clutter up the control board to enter it repeatedly. Entries should be made as in Figure 12.

In contrast, an "exception" type of change is an isolated or disconnected change, and, therefore, in each single instance of a change of this type a separate entry must be made. See Figure 13.

It has been found best to direct the recorder to enter all changes as usual except whenever the Executive or Board Standards are marked with a "P," indicating that a change is to be entered but once.* The executive will have no difficulty in predetermining what exceptions he wishes to class as "P."

As pointed out previously, exceptions are entered in red and green, respectively. It is convenient to color an entire square and to enter the details of the change in black ink. When this is done, the board can be analyzed more readily. A variety of colors may be easily adapted to show exceptions to standard procedures more plainly. However, it is recommended to extend the color scheme gradually rather than to start the control board with too many colors.

G. Layout of the Production Control Board.

It has been remarked previously that the final production control board will consist of several control charts (complete in themselves). The individual charts are mounted on a board in such a fashion as to be easily fastened and removed. Entries can then be made more accurately and quickly at a desk, and individual charts can be removed to the executive's desk for detailed analysis. In fact, the writer has given instructions to have all charts recording exceptions to the Executive Standard placed on his desk before they are mounted on the master production control board.

It is best to use graph paper ($8\frac{1}{2}'' \times 11''$) with holes punched in the paper to fit pegs on the mounting board. These pegs make it possible for the recorder to place new charts over completed ones for ready reference. When too many charts accumulate, older ones may be removed and filed. It is well to remember to mount the control board in such a position in the office that is can be clearly seen from the executive's desk.

Analysis

The success of this entire method depends upon the ability of the executive to draw the correct conclusions from the production control board. The analysis is concerned not only with individual exceptions which have occurred, but also with the sequence of changes.

Please refer to Figure 2 (page 550) to follow this discussion of the analysis.

Note that the parts of this figure are:

(1)—Executive Standards
(2)—Board Standards
(3)—Phases in consecutive order
(4)—Production board

The board also tells that batches were manufactured as follows:

Jan. 15—Batches No. 26 to 28
Jan. 16— " " 29 to 34
Jan. 17— " " 35 to 40
Jan. 18— " " 41 to 43.

A. Analysis by Phases.

Phase 1 belongs to the Executive standard and was violated twice, in batches 28 and 39.

Phase 2 belongs to the Board standard and was violated in batches 26, 32, 33, 38, 40, 41, 42, 43. The violation was first reported in batch 26. It seems that at that time it was an isolated occurrence. Two consecutive violations were recorded in batches 32 and 33. This should have put the executive on the alert. Apparently he did not pay much attention to the violation even after it was reported in batch 38. This caused the collapse of the entire phase starting from batch 40 on to the end.

Phase 3 is a "double-standard" phase. Material AMa_i has to be controlled; the material and the manufacturer belong to the Executive standard, (A-M); and the shipment and box belong to the Board standard, ($-a_i$). Analysis shows that new boxes were opened for batches 28 and 36; for batch 39, a change of manufacturer occurred (naturally, shipments and box numbers start anew). In batch 42, the second box of this new manufacturer's shipment was used.

Phase 4. Limits have been set on board standards which, when exceeded, indicate exceptions to Executive Standards. The first four exceptions are exceptions to the Board standard; the last is to the Executive standard. Analysis indicates that the significance of the change appearing at regular intervals may have escaped the executive's attention (causes might have been traced to a certain machine or operator). Had steps been taken to investigate these early exceptions, the final deviation (from the Executive standard) might have been avoided.

Phase 5 belongs to the Executive standard. A simplified entry has been recorded in batch 39, to show that the Executive standard has been exceeded by 50.

B. Analysis by Batches.

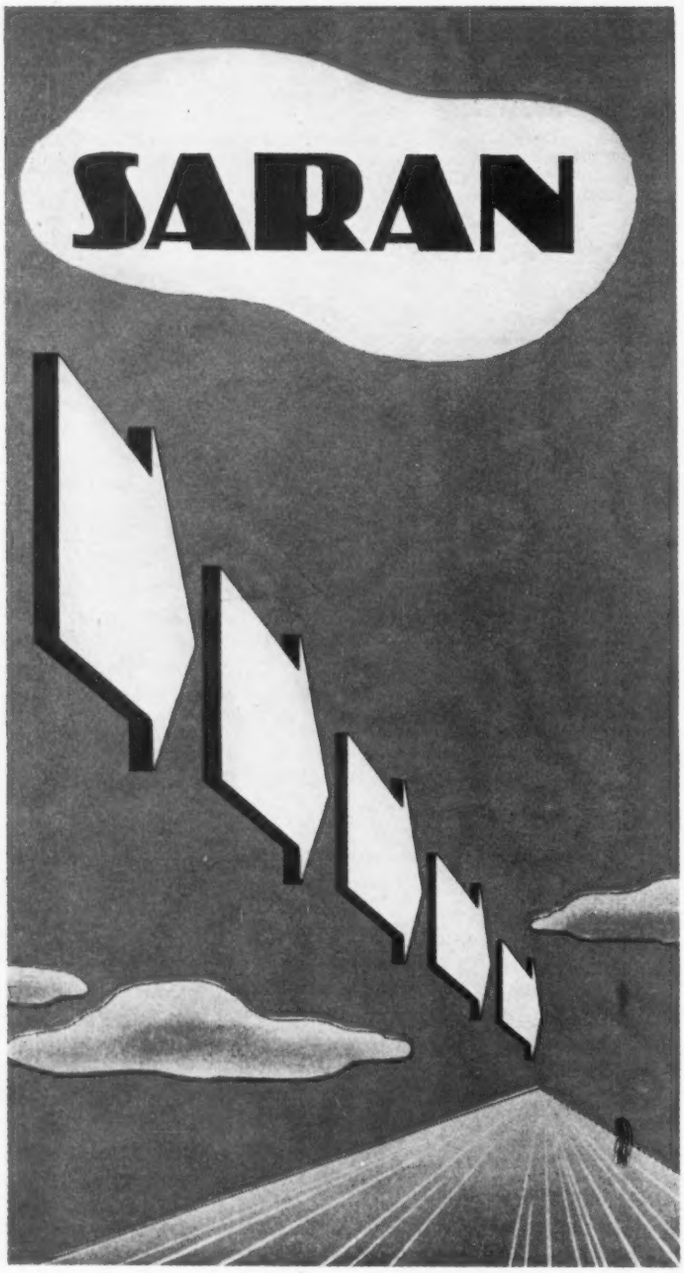
An analysis of batches is often imperative in checking back when complaints have been received on certain batches.

For example, complaints were received, let us say, that batch 39 did not comply with usual standards of quality. A glance at the board will tell that:

(a) Phase 1 was violated
(b) Material of a new manufacturer was introduced (Phase 3)
(c) Executive standard of phase 5 was exceeded by 50.

Knowing that a previous violation in Phase 1 (Batch 28) has not brought complaints, the executive will have to focus attention on the remaining two exceptions to standard procedure. Analyzing further, he notices that the change of manufacturer in Phase 3 resulted in no complaints in the batches following 39, and therefore he can rule out this phase. The decisive factor, he then concludes, is the change in Phase 5—the departure from the Executive standard.

* Sustained changes in production may necessitate replacing the relative standards (Master Cards) and, accordingly, the Executive and Board Standards.



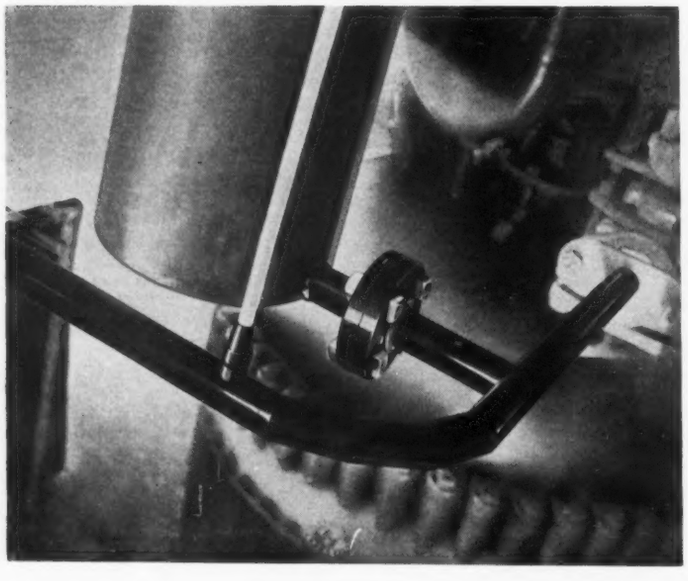
PIPE and TUBING

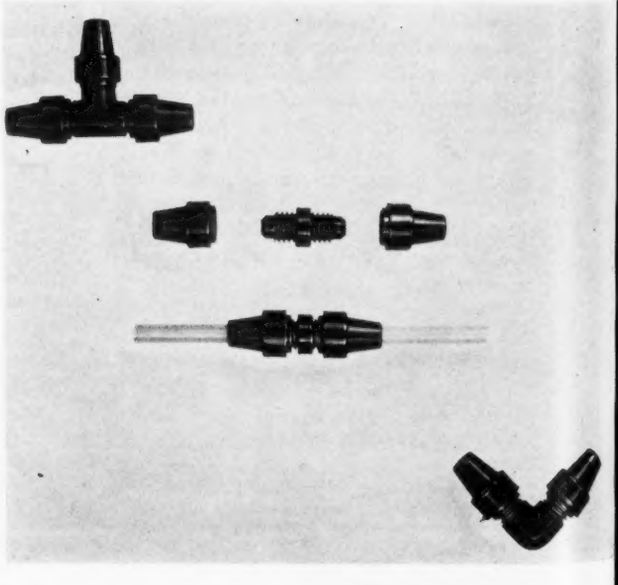
TODAY, more than ever before, the eyes of America are looking to plastics for the solution to the stringent metal situation. The chemical industry has accepted the responsibility of producing much needed products that will replace stragetic materials, such as metals and rubber, and release them for the production of essential war goods.

There are several plastics commercially available, each possessing marked characteristics that make it best fitted for specific applications. Outstanding among all plastics is saran—a product of the Dow Chemical Company which is commercially available as pipe and tubing and in other forms.

Saran pipe is one of the Dow Chemical Company's most recent plastic contributions to the victory program. This revolutionary pipe is made of a chemically resistant thermoplastic resin that has already proved its practicability in

Below left, standard welded fittings are easily fabricated with Saran pipe. This photo shows application of tee and elbow weld. Below right, various fittings of Saran tubing. (Threaded precision parts).





numerous difficult applications to which it has been subjected. It was designed principally to play an outstanding role wherever service requirements would be too severe for other materials. Because of its unusual properties, it offers almost unlimited possibilities to chemical processing plants; oil, gas and water companies; and innumerable general industries.

Saran pipe and tubing is tough, durable, flexible and non-scaling. Other unique properties are its amazing resistance to the abrasive and corrosive action of soaps, oils, chemicals and moisture. It resists freezing and is heat resistant to 170° F. Listed on the next page are the results of wide range chemical resistance tests conducted over a three-month exposure.

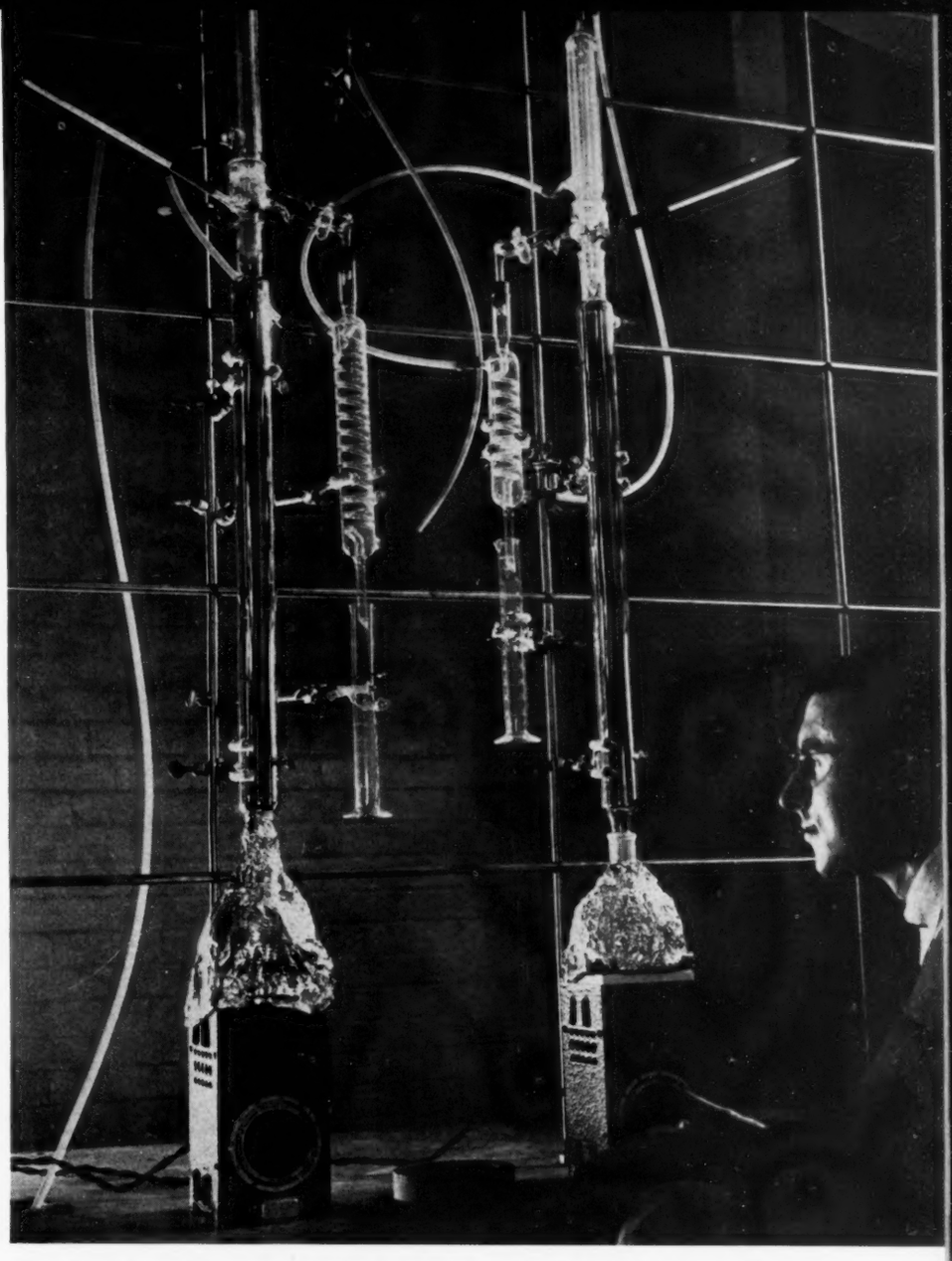
Production of Saran pipe by a modified extrusion process assures a smooth, round material with dimensions identical to those of extra strong iron pipe. At present, sizes are ½", ¾", 1", 1¼", 1½" and 2". Larger sizes are promised in the near future.

Sharp standard pipe dies can be used to thread saran pipe, an operation which exactly parallels cutting of standard pipe threads on metallic pipe, and make it practical to install saran pipe with either metallic or saran fittings.

Standard flanges of saran are available in sizes from ½" through 2". These are standard iron pipe companion flanges that conform to present size specifications. Other fittings such as couplings, reducers, nipples, ells, bushings and plugs, will be available as rapidly as molds can be constructed.

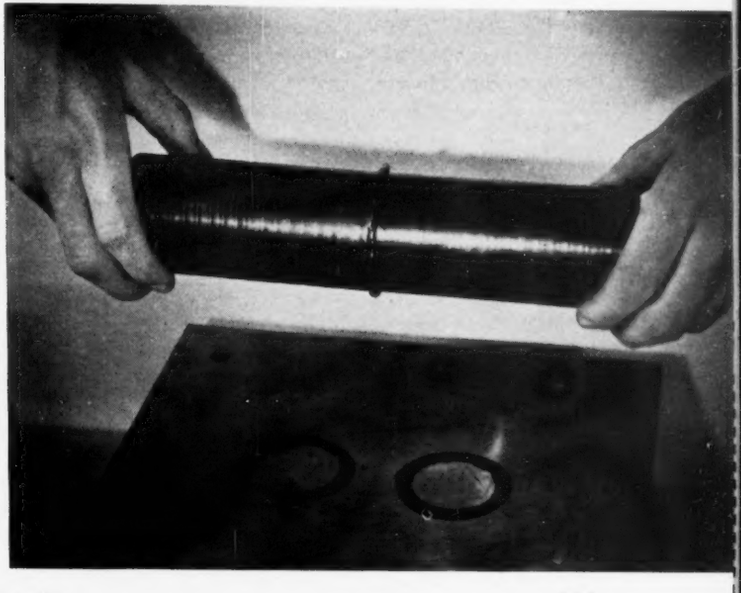
An important factor in shipping, general handling and suspension is saran's weight—less than one quarter that of iron!

Welding operations with saran pipe are



The flexibility of Saran tubing has made it readily adaptable as a replacement for rubber tubing in the laboratory. Here apparatus is almost rubber-free.

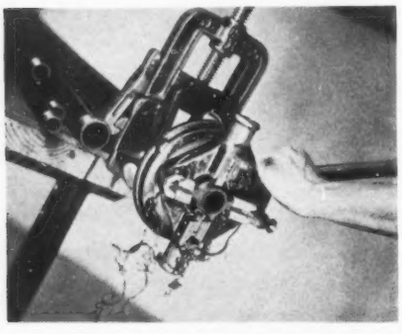
Below left, simplified method for welding Saran pipe. Gas flame heat is applied to a hot disc. Below right, two pieces of Saran pipe are held together after heating at 350 to 400° F. and allowed to cool for 10 seconds. After 24 hours the joint has strength equal to any other portion of the pipe. Plate below is the heating implement in this process.



simple, rapid and can be accomplished in less than one minute! Two lengths of pipe are placed on a hot plate (temperature 350° to 400°F.) and held long enough to form a small inventory of molten material. The bead or molten material inventory is visible at the outside surfaces of the two pieces. Then the two ends are pressed together and allowed to cool for a few seconds. Within 24 hours the welded joint has strength equal to any other portion of the pipe.

Direct heating methods are ideal for welding in the field. Saran pipe lends itself, under adverse conditions, to this method, for it can be easily welded with use of a gas flame or torch heated unit, against which two pieces of pipe are placed. The general rules of hot plate welding should be observed and care must be taken not to overheat the material for this will substantially weaken the joint.

In the same field, Dow offers American



Saran pipe can be threaded on standard equipment. It is easy to handle but sharp dies should be avoided.

industry another equally useful plastic innovation—saran tubing. Here is a tubing that replaces metal piping in homes, industrial plants and machines that require the piping of gas, air, water and a wide variety of corrosive liquids.

Some astounding facts about this tough but flexible tubing follow: It withstands freezing and continuous heat up to 170°F., accommodates high and low pressures, is non-corrosive and non-scaling. Saran tubing, already in use in many commercial installations, is fabricated in a wide range of sizes and wall thicknesses. It can be secured from ⅛" to as large as ¾" in diameter with the promise of even larger sizes soon.

Saran is well adapted to the molding of threaded precision parts, and fittings are injection molded of the same plastic material used so successfully in extruded tubing. It is important that they be tough, durable and accurate so they will stand up under extremely difficult applications formerly requiring metal. Saran tubing may be installed with most flare or compression type metal fittings or with special fittings molded of saran.

The properties of saran speak for themselves. Saran pipe and tubing gives unexcelled service with a nominal maintenance cost. By using plastic materials, a great saving can often be accomplished by dispensing with so-called necessary production repairs and attendant losses in man hours and money.

Saran pipe, tubing and fittings give industry new tools to keep America producing for the war program.

CHEMICAL RESISTANCE OF SARAN PIPE

(At Room Temperature)

Reagent	Stability Rating	Reagent	Stability Rating
98% (Conc.) H_2SO_4	Good	Ethylene Dichloride	Poor
60% H_2SO_4	Excellent	Di Ethyl Ether	Poor
10% H_2SO_4	Excellent	Dioxane	Unsuitable
35% (Conc.) HCl	Excellent	Benzene	Fair
30% H_2SO_4	Excellent	O-Dichlor Benzene	Poor
10% HCl	Excellent	Ethyl Gasoline	Excellent
65% (Conc.) HNO_3	Excellent	Turpentine	Excellent
10% HNO_3	Excellent	Triethanolamine	Excellent
Glacial$_3$ Acetic	Excellent	Lubricating Oil	Excellent
10% Acetic	Excellent	Linseed Oil	Excellent
5% H_2SO_3	Excellent	Bromine Water	Unsuitable
Conc. Oleic	Excellent	Chlorine Water	Unsuitable
50% NaOH	Fair	Bleaching Solution	Excellent
10% NaOH	Good	10% Duponol	Excellent
28% NH_3	Unsuitable	10% Zinc Hydrosulfite	Excellent
10% NH_3	Poor	15% $CaCl_2$	Excellent
Ethyl Alcohol	Excellent	15% $FESO_4$	Good
Ethyl Acetate	Fair	Water	Excellent
Acetone	Fair	Air	Excellent
Methyl Iso-Butyl Ketone	Fair	* Three Months of Continuous Exposure	
Carbon Tetrachloride	Good		

The stability rating given is based upon observed changes in color, weight, dimension, tensile strength and hardness of the samples tested.

Properties of Saran the thermoplastic resin from which Saran pipe is made

Property	Molded and Extruded Forms (Unoriented type)	Property	Molded and Extruded Forms (unoriented type)
Mold Shrinkage (injection)	.008-.012 in. per in.	Resistance to Heat (Intermittent)	212°F.
Specific Gravity	1.68-1.75	Softening Point	240-280°F.
Refractive Index	1.60-1.63	Distortion Point	150-180°F.
Tensile Strength—Ultimate	4,000-8,000 lbs. p.s.i.	Dielectric Strength, Short time, volts per mil. ¼" thickness	500
Compression Strength at Yield Point	7,500-8,500 lbs. p.s.i.	.001" Thickness	3,000
Elongation at Yield Point	15%-25%	Dielectric Constant 60, 10^3 and 10^6 cycles	.03-.15
Modulus of Elasticity Tension, lbs. p.s.i. 10^5	0.7 to 2.0	Water Absorption (ASTM D570-40T)	Less than 0.1%
Flexural Strength	15,000-17,000 lbs. p.s.i.	Burning Rate	Self Extinguishing
Impact Strength ½x½" Notched Bar, Izod	2-8 ft. lbs. per in.	Effect of Age	None
Thermal Conductivity, 10-4 cal. /sec/sq.c.m. /1°C./cm.	2.2	Effect of Sunlight	Darkens Slightly
Specific Heat, cal./°C. /gram	.32	Effect on Metal Inserts	Inert
Thermal Expansion 10^{-5}/°C.	15.8	Machining Qualities	Good
Resistance to Heat (Continuous)	170°F.	Welding Ability	Unexcelled
		Clarity	Translucent to Opaque
		Color Possibilities	Extensive

6 sizes of Saran pipe available

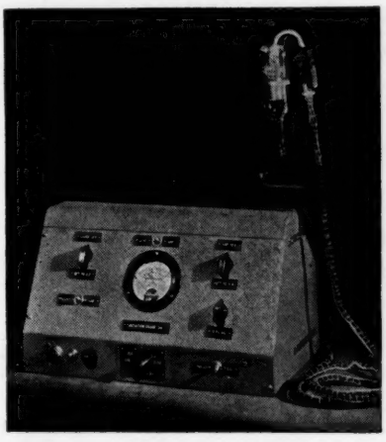
Nominal Size	O.D.	I.D.	Calculated Lbs./Ft.	Ft./Lbs.	Bursting Pressure 25°C.
½"	.840"	.546"	.236	4.23	1500 lbs. p.s.i.
¾"	1.050"	.742"	.320	3.12	1060 lbs. p.s.i.
1"	1.315"	.957"	.472	2.12	970 lbs. p.s.i.
1¼"	1.660"	1.278"	.650	1.550	820 lbs. p.s.i.
1½"	1.900"	1.50"	.790	1.27	740 lbs. p.s.i.
2"	2.375"	1.939"	1.09	.918	620 lbs. p.s.i.

NEW EQUIPMENT

Ionization Gauge Meter QC 197

A limited number of Distillation Products' new portable Ionization Gauge Meters, Type HG-200, may soon be available, according to an announcement from the company. This new meter, which is designed to operate in conjunction with the Distillation Products Ionization Gauge, Type VG-1, provides a method of measuring pressures from 10^{-3} to 10^{-9} mm. of mercury.

The Ionization Gauge Meter circuit features a stabilized amplifier in a balanced vacuum tube of voltmeter design with negative feedback, and an integral amplifier recalibration for elimination of amplifier variation. Other variations in performance are prevented by gas tube voltage regulation and automatic grid current control.



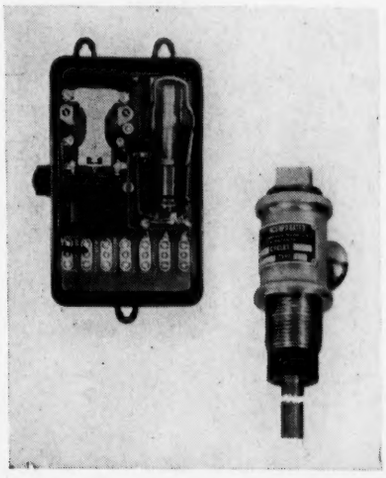
To produce a complete cycle of operation, a switch need only be thrown to de-gas the grid of the ionization tube, while the amplification of the circuit is set to a standard value on the single meter, and the grid current is set to the correct value where the circuit will hold it constant. The plate current can then be read directly from the meter and converted to pressure readings with the factor of the ionization tube. The Distillation Products Ionization Gauge, Type VG-1, used in this arrangement, has a high sensitivity of 200 microamperes per micron.

The circuit which is already in use on many production systems, including the exhaust of large transmitting tubes, has proved itself to be reliable and rugged. The meter is simply designed so that it can be handled by nontechnical employees.

Furnished in a cabinet of gray-crackle finish the unit comes complete with all necessary cords and plugs, and ionization tube ready to seal onto any Pyrex system. It operates on any 110-115 volt, 60 cycle line.

Water Detector Lock QC 198

Photoswitch Incorporated, announces Electronic Water Detector Lock Type P15NH to indicate water seepage in gasoline storage tanks.



The new unit is supplied with Probe Fitting Type H31. The probe fitting is mounted in a standard pipe fitting on the top surface of the tank, the probe rod projecting down through the tank to the level at which water seepage is to be detected—usually three inches from the bottom of the tank. Detector Lock Type P15NH is located an any point remote from the tank and wired to the probe While the probe rod is entirely immersed in gasoline and as long as water seepage has not reached the probe, no signal is given When water seepage rises to contact the probe tip, an electrical circuit is completed through the water itself, and the water detector lock operates, turning off pumping equipment and actuating an alarm circuit.

The unit operates on 115 or 230 volts A. C. A battery-operated unit is also available as standard

Photoswitch water detector locks will handle output loads up to 10 amperes at 115 volts A. C. Type P15NH is supplied in a weather-proof, pressed-steel housing, finished in green crystal. Explosion-proof housings are also available. Probe fitting Type H31 is furnished in brass, stainless steel, and other metals.

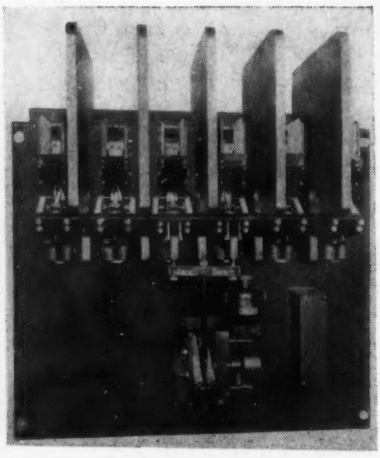
Circuit Breaker QC 199

A new high-speed air circuit breaker developed by the General Electric Company minimizes "arc back"—a problem engineers have been battling since the first commercial mercury arc rectifier installation. It was described in a paper presented at the summer convention of the American Institute of Electrical Engineers in Chicago by J. W. Seaman and L. W. Morton, of the company's Switchgear Division and Power Rectifier Engineering Department, respectively.

Application of the new Type AG-1 breaker will lessen the possibility of power interruptions in war plants using direct current for the reduction of vital metal such as aluminum and magnesium, and for various continuous processes, it was pointed out. The new breaker removes short circuits in less than one cycle, or faster than 1/60 of a second.

In effect, the authors explained, arc back is a short circuit on the power system during which the current can increase to excessively high values.

They stated that in large installations where a number of rectifiers are operated in parallel, current increases greater than ten million amperes a second have been observed. For a single rectifier, the rate of increase of current can be as much as six million amperes per second.



Such rates of rise are due to the fact that current flowing through the anode circuits of a rectifier immediately feeds into the anode circuit where the arc back occurs. Other rectifiers on the same bus will also feed into the faculty circuit. This reverse current flow in the circuit of the faulty anode circuit must be interrupted before it reaches proportions that will cause damage to the rectifier and associated equipment such as bus runs and transformers.

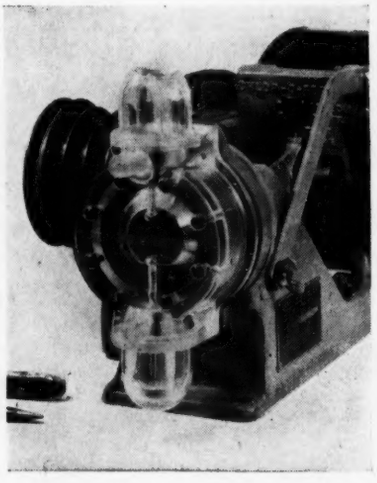
By interrupting the circuit in less than one cycle, the new circuit breaker limits the current that can flow into the faulty anode to values of less than 50,000 amperes.

One reason why the new breaker can do this is that its design utilizes the effect of magnetic loop expansion. This works to a double advantage. Where the circuit is normal, the increased pressure at the contacts prevents burning of their surfaces. But when the breaker is tripped during abnormal circuit conditions, the magnetic loop expansion effect helps get the contacts separated quickly. Low-inertia moving parts in the device further speed the break.

A high-speed current directional trip initiates the opening of the contacts. Responsive only to the reverse current flow of an arc back, it starts the action of the new breaker in less than one-half cycle. The breaker has an arc chute of the magnetic blow-out type which multiplies the magnetic effect of the current through it and rapidly lengthens the arc back to its extinguishing point. The breaker automatically closes the cleared circuit in about one minute.

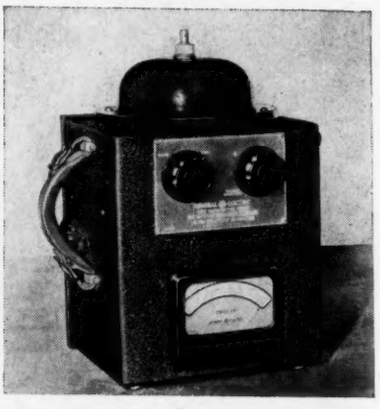
Plastic Feeder Heads QC 200

Transparent Crystalite moldings, which permanently withstand chemical solutions, and at the same time permit full visibility of vital working parts, are now being used for sight feeders and reagent heads on Chlor-O-Feeders, Chem-O-Feeders and other water purification equipment manufactured by Proportioneers, Inc. According to the company hypochlorite solution, soda ash and alum are among the chemicals to which the plastic heads have demonstrated complete resistance with no loss of transparency. In addition to chemical resistance and visibility, the injection molded Crystalite parts are permanently able to withstand hard knocks and shocks.



New Voltmeter QC 201

A new electronic crest voltmeter announced by the General Electric Company is designed to measure ignition voltages of internal combustion engines; surge voltages caused by corona and surface discharges in the insulation on such electric equipment as motors, generators, and cables; and other repeated-impulse voltages up to 30,000 volts.



The instrument weighing only 23 pounds, fills the need for a portable crest voltmeter for both laboratory and production testing. It is suitable for field measurement, such as trouble shooting and the determination of actual operating conditions, and can also be used for testing aircraft engines in flight.

The crest voltmeter can be used in areas where no electric power is available since it has a self-contained battery power supply. It can be moved readily to any location for testing purposes—a valuable feature when the equipment to be tested is too large to be moved conveniently

The voltmeter is equipped with an aircraft-instrument movement to provide resistance to vibration. It can be supplied marked and calibrated for any of the following scale ranges: 0-10,000 volts; 0-20,000 volts; 0-30,000 volts.

* * * * * * * * * * * * * * * *

For more information, circle the reference numbers on the postcard below. Give your name, company and address. Detach and mail. No stamp required.

Chemical Industries, 522 Fifth Avenue, New York, N. Y. (10-2)

I would like to receive more detailed information on the following equipment. (Circle those desired.)

QC197 QC198 QC199 QC200 QC201

Name ..... (Position) .....

Company .....

Street .....

City and State .....

The Alkyl Esters of Phosphoric Acid

(*Continued from page 521*)

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M. L. Crossley

(*Continued from page 511*)

problems and coordinating the maze of information gathered by his staff, as well as in inspiring his assistants, Crossley scored an enviable record of accomplishments at Calco. Under his direction yields and quality were improved, processes were devised to reduce losses of time and materials, and accurate methods of analyses and control were formulated. Under him the research organization was developed to its present staff of —— members, whose work covers activities ranging from dyes, rubber chemicals, and intermediates, to pharmaceutical compounds. In 1941 Crossley was elevated to Director of Research of the parent American Cyanamid Company.

Throughout his career Crossley has been a natural leader of men, and an inspiration to his staff. In the classroom his policy was to inspire students to want to know chemistry, rather than to stuff them with facts. He carried into the laboratory not only the calmness and character of a great teacher, but the high desire to assist others, coupled with an insight and respect for the other fellow's viewpoint. Consequently he is admired by all who know him, and his fellow workers deem it a privilege to be associated with him.

The spirit of the teacher—the desire to share his knowledge freely with others—has prompted Crossley to publish more than sixty scientific papers pertaining to chemistry and biology. Most of these technical papers deal with dyes and intermediates. Others obviously are to guide the student: "What is a Chemist?"; "Training for the Profession of Chemistry," etc. Still others of his works, like his chapters for "Chemistry In Industry," and "Survey of American Chemistry" (the latter published annually for the National Research Council), reflect the later, industrial activity of his career.

In 1924 Crossley was elected president of the American Institute of Chemists. At that time the Institute was in its formative stage, and he contributed much to its stability and growth. He was chairman of the Connecticut Valley Section of the American Chemical Society from 1915-17. In 1926 he became chairman of the Dye Section of that society, and by that fact one of its vice-presidents. In the same year he was delegate to the International Union of Pure and Applied Science. He is a member of the Society of Chemical Industry (London), the Faraday Society, a fellow of the American Association for the Advancement of Science, and of the New York Academy of Sciences; a member of the board of directors of the American Institute of the

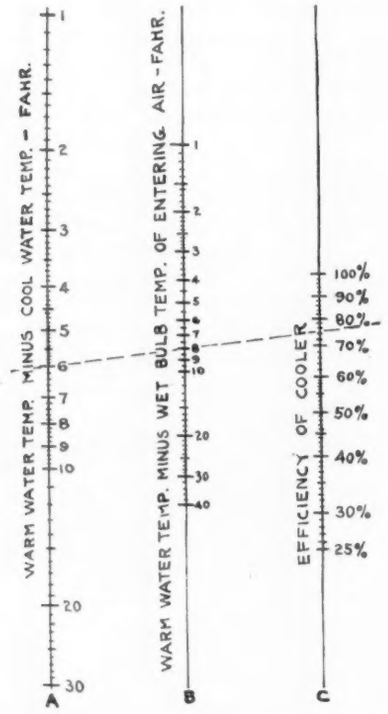
(*Continued on page 621*)

PLANT OPERATIONS NOTEBOOK

By W. F. Schaphorst

Efficiency of Cooling Towers

Air conditioning and refrigeration are being so commonly employed these days that in many cities the water problem is becoming acute. Water is needed for cooling in the refrigeration processes, and owing to the fact that water always has been abundant and is comparatively cheap it has been allowed to go to waste into the sewer. As a result cities have found it necessary to make restrictions regarding water consumption. The logical answer therefore is: use water cooling and water saving devices such as the cooling tower.



In addition to air conditioning there is the Diesel engine and other internal combustion engines which must be cooled. Much water has been wasted into the sewer in this way and it is not at all uncommon, now, to find cooling towers being used in conjunction with Diesels. For these purposes the cooling devices usually pay for themselves in a short time and are well worth while.

Herewith is a chart, prepared by the writer, for determining cooling tower efficiency. If you have a cooling tower, or are contemplating the installation of a device of that nature, efficiency is important. The chart is used as follows:

Subtract the temperature of the water after it is cooled from the temperature of the same water before cooling, and locate the difference in column A.

Then subtract the wet bulb temperature of the entering air from the temperature of the water before cooling and locate the difference in column B.

Now run a straight line through the two located points in columns A and B and the intersection with column C gives the efficiency of the cooling tower or cooling device.

For example, the dotted line drawn across the chart shows that if the temperature of the water before cooling is 88 and the cooled water temperature is 82 the difference, 6, is located in column A. If the wet bulb temperature of the entering air is 80, subtract from 88 and locate the 8 in column B. The straight line then gives the efficiency of the cooling device as 75%, in column C.

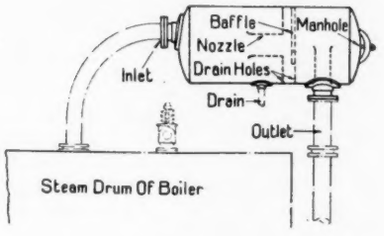
During summer months one should expect an efficiency of 65 to 70 per cent. If an efficiency of 90 per cent is reached by your device that may be regarded as good. An efficiency of 35 per cent would be called poor. Much, of course, depends upon weather conditions.

Steam Separator

For turbine, engine, and other uses clean steam is very essential in these days of high steam velocity. high temperatures, and high pressures.

Where steam is not clean we commonly find deposits of scale or dirt in engine cylinders and on turbine blades. Sodium sulfate, dirt, and calcium carbonate are the principal offenders. Not only do the impurities clog but they cause damage by cutting turbine blades and valve discs, making traps and valves inoperable, ruining engine cylinders, etc.

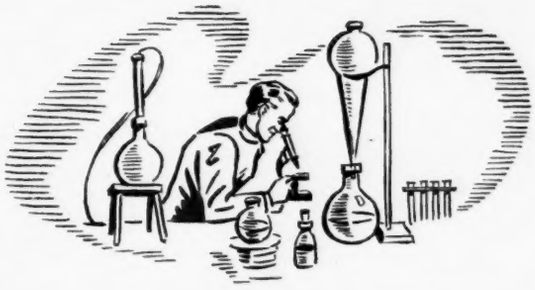
To avoid these troubles one of the simplest methods is the installation of a steam separator. A good design is shown in the sketch herewith. The function of the separator is to eliminate moisture. By getting rid of moisture all dirt is eliminated also, because it is only the water in steam that carries over the impurities. Dry steam cannot carry scaling impurities.



Furthermore if steam is dry there can be no dangerous slugs of water. Slugs of water, as from foaming, priming or condensation in the pipe lines, frequently strip blades in turbines and are almost invariably destructive to reciprocating engines. Cylinder heads are frequently blown off or broken, studs stripped of their threads or pulled apart, cylinders cracked, piston rods, cranks, connecting rods and frames twisted, bent or broken, etc.

Although separators are installed principally to make steam dry and clean, there is also a thermal saving involved. This saving is sometimes small and sometimes it amounts to a great deal. By removing all moisture, superheat can be increased. Hence from a heat standpoint, when using superheated steam, one can count on an increase of about 17 degrees to every 1 per cent of moisture removed. A rule sometimes used is that "each pound of water entails the consumption of an additional pound of steam to produce the same power."

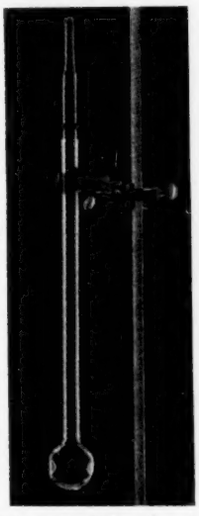
Some turbine manufacturers give the reduction in steam turbine water rate of 1 per cent for every 12 degrees increase in superheat. If 2 per cent of moisture is removed the superheat would therefore increase 34 degrees, which would be equivalent to almost 3 per cent reduction in turbine water rate. One can easily figure for himself what this amounts to during an entire year. It may mean that the separator will actually pay for itself within the first year as an economizing device, and in addition the owner gets clean and dry steam as well as machine protection.



THE LABORATORY NOTEBOOK

Stirring Device

An all-glass stirrer, which is very useful for agitating heavy solids, such as ice, in a liquid medium, is described in a recent pamphlet by Eastman Kodak Co. The usual propeller-type stirrer is too fragile, but the ball-type illustrated here is said to have proved very satisfactory for many purposes.



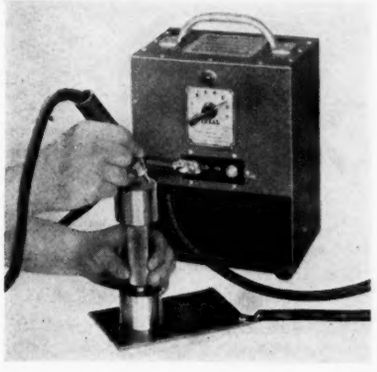
This device consists of a hollow globe with indentations arranged symmetrically around the periphery. If mounted so that it is balanced properly, it can be operated at high speeds because it has no projections to strike the solids violently. When used in a flask, the stirrer may be sealed by means of a long glass sleeve or with conventional mercury seal.

Diazotizations, which are generally acid reactions with ice as the internal coolant, and nitrations, with dry ice as the solid cooling medium, are typical procedures in which this type of stirrer is most efficient.

Metal Etcher

The Ideal Commutator Dresser Company has announced a new electric etcher that permanently marks anything made of steel, iron or their alloys.

To etch small tools and parts they are placed on the work plate, the switch turned "on" to proper heat and the desired identification written on. A ground clamp attached to the work plate is provided for etching large, heavy parts and castings. Everything may be completely enclosed in a compact case when not in use.



"Hi-Lo" taps and a seven point switch give 14 etching heats between 115 and 1300 watts. A red lamp on front of Etcher indicates when power is "on" and burns brighter as each higher heat is used. Depth of mark can also be controlled by speed of writing.

The etching tool has special heat radiating fins and an alloy tip point. Secondary cables have asbestos covering, work plate is 4″ x 7″ with ground clamp attachment, 115 volt, 50-60 cycle standard—other voltages and frequencies available. Maximum rating 1300 volt amperes. Weight—32 pounds.

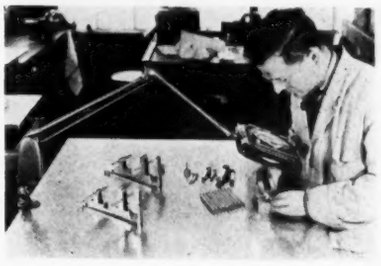
Machine shops, tool rooms, etc. have a number of uses for electric etchers. Permanent identification minimizes loss and theft of costly, hard-to-get tools and instruments. Permanent marking of materials and parts avoids confusion and mistakes.

Stopcock Lubricant

Laboratory workers will be interested in an ether-insoluble stopcock lubricant recently described by B. L. Herrington and M. P. Starr (Ind. & Eng. Chem., Anal. Ed. 14:62, 1942). The lubricating gel is prepared by suspending 9 grams of soluble starch in 22 grams of glycerine and heating to 140°C. After standing a short time, the clear solution is decanted from the sediment and allowed to cool. After standing overnight, the mixture has the consistency of a heavy grease.

Handy Magnifiers

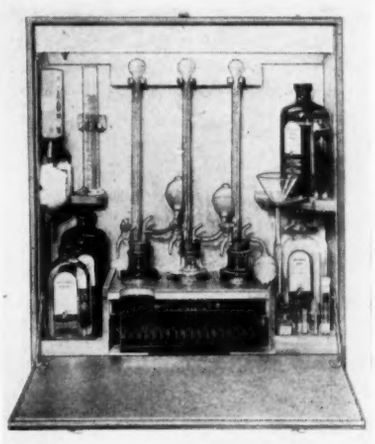
Four new models of "Super-Sight," magnifying lens and light units, have been announced by the Boyer-Campbell Co. These instruments combine magnification and properly directed light. They are used for close inspection, fine assembly and precision work. Fitted with mounting brackets for use on benches or machines, they are available in four or



five inch lens sizes and also in double lens units (telescope principle) for increased magnification. Beside the regular industrial and laboratory uses, the instruments are said to be very handy in firstaid work for removal of foreign bodies from eyes, of splinters from fingers and in the examination of cuts and other injuries.

Water Testing Equipment

A new series of Water Test Sets is announced by W. H. and L. D. Betz. These "A" Series Test Sets include the necessary chemicals and apparatus for determining hardness, alkalinities, chlorides, phosphates and sulfites in water, when any two, three or four of these tests are



required. A special cabinet designed for use on table or wall is provided. All chemicals and apparatus are contained in the cabinet, held in a secure position and ready for instant use. A portion of the opened cabinet door forms a convenient acid-resistant laboratory work table, and a fluorescent light provides illumination for the tests.

INDUSTRY'S BOOKSHELF

Without Fame, by Otto Eisenschiml, Alliance Book Corp., Chicago, Ill., $3.50.

If it were not for the fact that the title "From Rags to Riches" has long been copyrighted for a book, that title might well serve as one for "Without Fame," Otto Eisenschiml's latest contribution to the appetites of the reading public.

And I say "reading public" rather than the "literary world," for "Without Fame" is a book for the scholar, the layman, the business executive, the technician and the student. That Eisenschiml is a chemist will make it, of course, so much more interesting to members of his profession.

From conditions approximating penury in Vienna to a state of affluence in Chicago, and arriving at this latter stage well within the age limits to enjoy to the full the fruits of his labors—just the briefest outline of such a life would make an interesting autobiography for anyone to read. But as one reads "Without Fame" and appreciates the handicaps under which our author acquired his basic *schooling* and the practical use to which he put this schooling in acquiring from life his real *education*—those of us who do not possess a college degree can take heart in the thought that though we may have attained reasonable success ourselves, additional goals may still be reached and those who may now or in the future face early educational restrictions, can work out a place in the sun for themselves.

Also our college degree men might well take heed and learn as our author so aptly expressed himself, that the weight of a degree, looped around the neck, will cause sufficient sagging of the physical and mental muscles to completely shut out the inherent possibilities of the individual. Hang the degree in the closet—forget it and carry the knowledge secured into the business fight—so implies the author.

We feel our author is a little too harsh in his ideas of what college may do for a man—some may be envious—there are too many advantages to be derived therefrom—perhaps as he states, the colleges are at fault, since there is too much of theory implanted with little or no fertilization that these theories might germinate for actual uses.

Refreshing it is to follow the author's life, to observe his pursuit of the interesting, enlivening type of work first—the money followed after; then the spreading of that money in staff compensations and ideal working conditions, among friends and business acquaintances, extending from Chicago back to Vienna and all leaving behind a flood of memories he must find soul satisfying.

The Stone that Burns, the Story of the American Sulphur Industry, by Williams Haynes, D. Van Nostrand Co., Inc., New York, N. Y., 345 pages, $3.75. Reviewed by A. M. Taylor.

The author has covered the history of the "Frasch Process" and its use from "A to Z," he has been unusually fortunate in having access to most of the original private data on the development of the process and the trials and tribulations of the prospector and developer. One cannot help but remember the old saws about "Gold is where you find it" and also "you never miss the water until the well runs dry," for as Mr. Haynes outlines, sulfur occurs in well defined geological formations, if these are not present the forked stick is of no avail and even if the conditions seem favorable you may not get your sulfur, and if you do get it the question may be will it last until morning.

A full description is given of the developments of the producing areas, the tonnage, their length of life and the total tonnage since this method of recovery has been practiced. There is more pertinent information on sulfur between the covers of this book than can be found elsewhere; it is replete with references to private files of the operating companies and bibliography of the subject, and an appendix that covers the production of sulfur from pyrites, smelter gases as well as brimstone.

No one interested in the origin and use of sulfur should fail to read Mr. Haynes' most interesting and most readable story of the "Stone that Burns."

Heat Transmission, by William H. McAdams, McGraw-Hill Book Co., Inc., New York, N. Y., 459 pp., $4.50.

This is a revised edition of an old standby on transfer of heat in the fields of chemical and mechanical engineering. Comprehensively treating the various fields of heat transmission, the book is based on considerable unpublished data as well as a critical examination of the literature.

The author, who is professor of chemical engineering at Massachusetts Institute of Technology, includes authoritative correlations for the various important cases of heat transfer and analyzes the new data made available by the research of recent years in light of the basic mechanisms by which heat is transferred. As a practical aid in the analysis and solution of new problems, he presents the recommended relations in the form of equations and graphs and illustrates the methods of attack.

This volume clearly explains heat transmission in terms of conduction, heating and cooling of solids, radiant heat transmission, dimensional analysis, flow of fluids, heat transfer between fluids and solids, heating and cooling fluids inside tubes, heating and cooling fluids outside tubes, condensing vapors, heat transfer to boiling liquids, and applications of design.

The final chapter describes various types of exchangers, summarizes the quantitative relations for heat transfer and pressure drop and develops detailed methods for design for fixed heat length, fixed pressure drop, optimum velocity.

Optical Methods of Chemical Analysis, by Thomas R. P. Gibb, McGraw-Hill Book Co., Inc., New York, N. Y., 382 pp., $5.00.

Optical methods play valuable roles in many organic and inorganic chemical analyses as they often yield results in a few minutes for determinations requiring days by conventional procedures. Also most of the methods are applicable to micro quantities, and the sensitivity is generally far greater than that of strictly chemical methods.

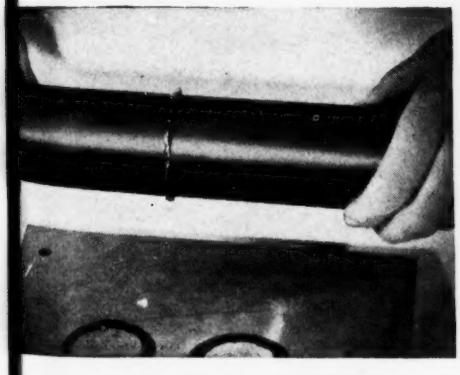
In this new manual in the International Chemical Series, the author, instructor in analytical chemistry, Massachusetts Institute of Technology, takes the point of view of the professional analyst and emphasizes the utilitarian aspects of the subject, discussing the theory essential to intelligent use of the methods, describing the important types of instruments, and giving explicit directions for their use in applying a number of different analytical procedures.

The practical treatment of this detailed volume emphasizes essential theory and fundamental information that will help the analyst to make an intelligent choice of alternative methods or to plan a workable method to fit his particular problem.

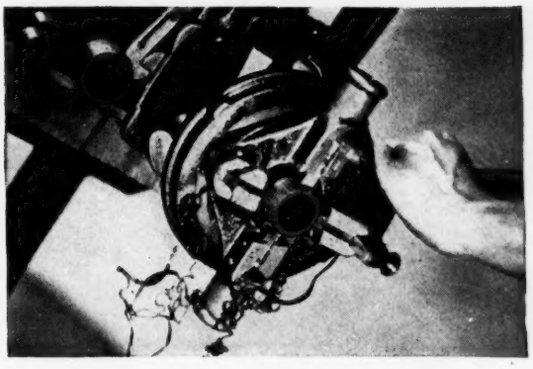
Useful tables, charts, schematic diagrams, chapter bibliographies, etc., round out this study of optical methods.

FOR THE CHEMICAL INDUSTRY— A NEW PLASTIC PIPE!

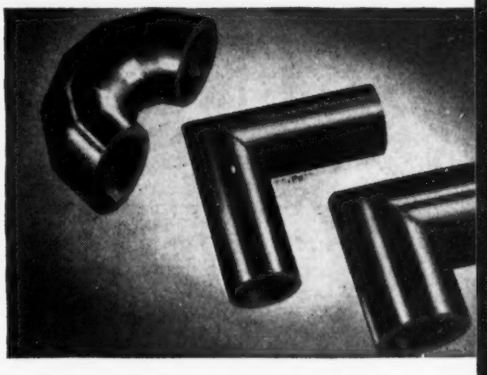
Welded in one minute! ***Threaded with standard tools!*** ***Welded joints easily made!***



Saran pipe is easily welded by pressing lengths together after heating on 350° F. hot plate. Joint has strength equal to that of the pipe itself.



Saran pipe can be threaded with standard pipe threading equipment. Operation exactly parallels cutting of standard pipe threads on metallic pipe.



Standard welded fittings, such as tees and elbows, are easily fabricated with saran pipe. Standard flanges available in sizes ½"-2".

THE PICTURES above answer three basic questions about the new saran pipe. Equally important is its remarkable chemical resistance. These factors give this first practical thermoplastic pipe almost unlimited possibilities in the chemical industry.

Saran pipe is noncorrosive, non-scaling, and is heat resistant to 170° F. Furthermore, the weight of saran pipe is only ¼ the weight of comparable sizes of iron pipe!

The wide adaptability of saran pipe suggests countless applications saving strategic rubber and metals as well as valuable time. Write to the Plastics Sales Division for free booklet, "Practical Data on a New Plastic Development."

THE DOW CHEMICAL COMPANY, MIDLAND, MICHIGAN

New York • St. Louis • Chicago • Houston • San Francisco • Los Angeles • Seattle

SARAN

THE CHEMICALLY RESISTANT PLASTIC

OTHER DOW PLASTICS

★ STYRON ★ ETHOCEL

★ ETHOCEL SHEETING

DOW

that can wasn't "planted"!

No specially posed advertising illustration is this picture!

It's an official Army photograph . . . straight from the files of the United States Army Signal Corps (SC-130812 to be precise) . . . and that Crown Can is there because it's actually in service!

When Crown wanted a picture to show a water purification unit of the U. S. Engineers in actual operation the Signal Corps supplied this picture. We did not tell the Army for which of our customers we wanted to use the photograph. It was our original intention only to use the picture as a background . . . and say that Sanitation HTH, the product of our customer, the Mathiesen Alkali Works, Inc., of New York, was used by the Army in many of these units.

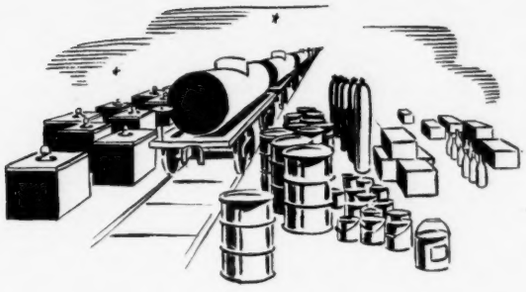
But when we got the print, there was a Crown Can holding Sanitation HTH, sitting on a rock with the trademark perfectly legible!

Just goes to show that you'll meet up with Crown Cans in lots of places the Army and Navy go in wartime!

CROWN CAN COMPANY, PHILADELPHIA, PA., *Division of Crown Cork and Seal Company*

PHOTO BY U. S. ARMY SIGNAL CORPS

CROWN CAN ★ ★ ★ ★ ★



PACKAGING & CONTAINER FORUM

By Richard W. Lahey

WPB Limits Steel Drum Use

LIMITATION Order L-197 issued by the W. P. B. on September 14th is copied in complete detail. It deserves the careful study of all users of steel drums. It is probable that the demand for tight and slack barrels, as well as fiber and plywood drums will create a situation which will severely tax the manufacturing facilities of these containers. It may well be that some products now packed in slack barrels and fiber and plywood drums will have to be transported in bags in order to make room for the products which are affected by this order. It is logical to assume that these products which have been packed in steel containers require special protection which can be more closely duplicated by non metallic drums and barrels than by bags.

The provision requiring that new and used drums sold, transferred, delivered, etc. be embossed with the letter "X" on one head has been deferred until October 1st in order to allow for the procurement of dies.

The order follows:

PART 3061—STEEL SHIPPING DRUMS
[Limitation Order L-197]

The fulfillment of requirements for the defense of the United States has created a shortage in the supply of steel shipping drums and of certain metals and materials used in the production of such drums, for defense, for private account and for exports; and the following order is deemed necessary and appropriate in the public interest and to promote the national defense.

§ 3061.1 *Limitation Order L-197*—(a) *Definitions.* For the purposes of this order,

(1) "Person" means any individual, partnership, association, business trust, corporation, governmental corporation or agency, or any organized group of persons whether incorporated or not.

(2) "Drum" means any single walled, cylindrical or bilged container with a capacity of 110 gallons or less (including but not limited to buckets, kits and pails) constructed wholly of steel. The term shall not be deemed to refer to cans or high and low pressure gas steel cylinders, or to any container not susceptible of commercial use in the transportation and storage of commodities.

(3) "Sale" shall mean any transfer of title of a drum or drums, with or without consideration, and shall include the transfer of possession of any such drum or drums, pursuant to a lease or rental arrangement.

(4) "Purchase" shall mean the receipt of any transfer described in subparagraph (3) of this paragraph (a).

(b) *Restrictions on use.* (1) No person shall use any drum, new or used, for packing any product which he had not packed in drums prior to the date of issuance of this order.

(2) On and after 60 days after the date of issuance of this order, no person shall pack any of the following products in a drum or drums, new or used:

Acid Succinic.
Alcohol, specially denatured (except the following formulas: #13A, #19, #20, #32, and #42).
Aluminum sulfate.
Ammonium bicarbonate.
Ammonium chloride.
Amyl acetate.
Amyl alcohol (from whatever source derived).
Amyl phthalate.
Arsenic acid, solid.
Arsenic trioxide.
Arsenical mixtures.
Asphalt (having maximum penetration of 95 at 75°F. ASTM).
Asphalt roof coatings or roof cements.
Balsam copaiba.
Bath salts.
Borax.
Bordeaux Mixture.
Boric acid.
Bottle washing compounds.
Butanol.
Butyl acetate.
Butyl oxalate.
Butyl phthalate.
Calcimine.
Calcium arsenate.
Calcium carbonate.
Calcium chloride.
Calcium hydroxide.
Calcium oxide.
Casein paints, dry.
Caulking compounds.
Cements, dry, Portland, shoe nonflammable, waterproofing, tar base.
Cement paint, dry.
Charcoal.
Chloride of lime.
Citric acid.
Cleaning compounds, dry.
Colors, inorganic, dry.
Colors, organic, dry.
Compounds, solid and semi-solid, with a melting point of 65°F. or above, used in cooking, including mixtures of lard and hydrogenated oils, but not limited to these mixtures.
Copper oxide.
Copper sulfate, basic.
Copper sulfate, monohydrated.
Dairy products.
Di ammonium phosphate.
Di calcium phosphate.
Di sodium phosphate.
Dyestuffs, dry.
Ethyl acetate.
Ethyl carbonate—all grades.
Ethyl oxalate.
Ethyl phthalate.
Fatty acids.
Flour.
Food products, cold pack and frozen included.
Fruits—brine.
Fruits and peels, glace.
Gelatine.
Glue.
Greases, animal and vegetable.
Greases, petroleum, solid and semi-solid (Greases with ASTM penetration of 300 and less).
Hexamethylenetetramine.
Hydrogenated oils with melting point of 65°F, or above, including but not limited to shortening.
Indigo paste.
Jelly, jam and preserves.
Kraut.
Lanolin and wool grease.
Lard.
Laundry alkalies.
Lead arsenate.
Lime.
Lime sulfur, dry.
Linseed oil meal.
Lithopone.
Magnesium oxide.
Marmalade.
Meats.
Metal degreasing alkalies.
Modified sodas.
Molasses.
Mono ammonium phosphate.
Mono calcium phosphate.
Mono sodium phosphate.
Moulding powder, except those for dielectric or insulating purposes.
Oil, crude.
Oils, steam cylinder, both compounded and uncompounded.
Olives.
Paints dry powder, including but not limited to those bound with glue, soya protein, casein and cement.
Paints, paste, water type (the vehicle of this type of product shall contain at least 5% water).
Paradichlorobenzene.
Paraffin wax.
Paste cutting compounds.
Paste drawing compounds.
Paste grinding compounds.
Paste rust proofing compounds.
Paste, wall paner.
Patching plaster.
Pectin.
Petrolatum.
Pickles.
Pine tar, solid.
Pitch, roofing.
Potassium bicarbonate.
Potassium carbonate.
Potassium chlorate.
Putty.
Resins, solid, rough-crushed and broken synthetic.
Scouring cakes and powder.
Shellac.
Silicate of soda, dry, ortho silicate, meta silicate, sesqui, or mixtures thereof.
Soap and detergents, dry.
Soda ash.
Sodium acid pyro phosphate.
Sodium arsenate.
Sodium bicarbonate.
Sodium chlorate.
Sodium chloride.
Sodium hexameta phosphate.
Sodium hydrosulfite.
Sodium metaborate.
Sodium nitrate.
Sodium sesquicarbonate.
Sodium tetra pyro phosphate.
Starches and adhesives, dry.
Sweeping compounds.
Syrup, mixed and unmixed (except chemical syrups and corn syrup).
Tallow.
Tar.
Tri calcium phosphate.
Tri sodium phosphate.
Vegetables—brine.
Vinegar.
Wax.
Wood fillers.
Zeolite.
Zinc hydrosulfite.

(c) *Restrictions on sale, delivery and use.* (1) No person shall manufacture or complete the manufacture of any drum which shall not have the letter X plainly and legibly embossed on the bottom plate thereof.

(2) No person shall sell any drum, new or used, or deliver such drum pursuant to a sale thereof (regardless of when the manufacture thereof was completed) unless said drum shall be plainly and legibly marked on the bottom plate with a letter X.

(3) No person shall remove, cover or conceal the markings referred to in sub-paragraphs (1) and (2) of this paragraph (c) unless same is necessary in the course of renovating, cleaning, painting or processing drums so marked, in which event the marking shall, within 48 hours, be replaced in as nearly as possible the original manner by the person effecting such renovation, cleaning, painting or processing.

(4) No person shall pack any of the following products in a drum or drums, new or used,

which was manufactured, purchased, or delivered on or after the 14th day of September 1942.
Asphalt, liquid.
Boiler feed water treatment material, liquid.
Corn syrup.
Disinfectants, liquid.
Dry lead oxide.
Flammable shoe cements.
Floor sealers.
Floor wax.
Formaldehyde.
Fuse powder, black sporting powder, "A" blasting powder, and all other potassium nitrate black powder.
Inorganic salts, aqueous solutions.
Insecticides, liquid, including fly spray.
Lead oxides in paste.
Leather finishes, blackings, dressing adhesives.
Lime sulfur solution.
Livestock dip and spray.
Oils, animal, fish, marine animal, vegetable, (except for fish livers and vitamin oils derived from fish or fish livers).
Paints, oil and oleoresinous type, including but not limited to white lead in oil, colors in oil, and oil stain.
Paris green.
Pine tar, liquid.
Printing inks (except aniline or spirit inks and roto-gravure inks).
Pyrethrum concentrate.
Rotenone.
Rust preventative with a flash point of less than 100°F.
Silicate of soda, liquid.
Shock absorber fluid.
Soaps and detergents, liquid.
Soaps, metallic.
Sodium lactate.
Starches and adhesives, liquid.
Turpentine.
Varnish and varnish stains, except liquid water-soluble phenolic resins.
Vat dyes, paste.
Wood preservatives.

(5) Notwithstanding the provisions of paragraph (c) (4), any person who owns a drum on the date of issuance of this order, whether such drum is then in his possession or is thereafter returned to him by another person, may use such drum for packing any of the materials listed in said subparagraph, so long as he retains ownership of the drums; but the provisions of said subparagraph shall become applicable as soon as he sells such drum.

(6) Nothing in this paragraph (c) shall prevent the purchase of ends or other parts or accessories for drums; nor shall the affixing of such ends or other parts to such drums prohibit their use in accordance with subparagraph (5) of this paragraph (c).

(d) *General exceptions.* (1) Nothing in this order shall apply to the use of drums for storage purposes by any person having less than 5 drums in use for all purposes.

(2) The restrictions on use specified in paragraphs (b) (1) and (2) and (c) (4) of this order shall not apply to drums which are used for the sale and delivery of commodities to the Army or Navy of the United States, the Maritime Commission, The Panama Canal, the War Shipping Administration, or such other governmental agencies as the Director General for Operations may designate.

(e) *Relationship to General Preference Order M-45.*[1] The provisions of this order shall govern to the extent that they may be inconsistent with any provisions of General Preference Order M-45 as amended.

(f) *Miscellaneous provisions.*—(1) *Applicability of priorities regulations.* This order and all transactions affected thereby are subject to all applicable provisions of the Priorities Regulations of the War Production Board, as amended from time to time.

[1] 6 FR. 5850; 7 F.R. 149, 3882.

(2) *Records.* All persons affected by this order shall keep and preserve for not less than two years after the effective date of this order accurate and complete records concerning inventories, production and sales.

(3) *Audit and inspections.* All records required to be kept by this order shall, upon request, be submitted to audit and inspection by duly authorized representatives of the War Production Board.

(4) *Violations.* Any person who wilfully violates any provision of this order, or who, in connection with this order, wilfully conceals a material fact or furnishes false information to any department or agency of the United States is guilty of a crime, and upon conviction may be punished by fine or imprisonment. In addition, any such person may be prohibited from making or obtaining further deliveries of, or from processing or using, material under priority control and may be deprived of priorities assistance.

(5) *Appeals.* Any person affected by this order who considers that compliance therewith would work an exceptional and unreasonable hardship upon him, or that compliance therewith would disrupt or impair any program of conversion from non-defense to defense work, or that compliance therewith would result in a degree of unemployment which would be unreasonably disproportionate compared with the amount of materials conserved, may apply for relief to the War Production Board by letter or other written communication, setting forth the pertinent facts and the reason or reasons why such person considers that he is entitled to relief. The Director General for Operations may thereupon take such action as he may deem appropriate.

(6) *Communications.* All reports required to be filed hereunder and all communications concerning this order shall, unless otherwise directed, be addressed to: War Production Board, Containers Branch, Washington, D. C. Ref: L-197. (P.D. Reg. 1, as amended, 6 F.R. 6680; W.P.B. Reg. 1, 7 F.R. 561; E.O. 9024, 7 F.R. 329; E.O. 9040, 7 F.R. 527; E.O. 9125, 7 F.R. 2719; sec. 2 (a), Pub. Law 671, 76th Cong., as amended by Pub. Laws 89 and 507, 77th Cong.)

Issued this 14th day of September 1942.

AMORY HOUGHTON,
Director General for Operations.

Silver Linings for Chemical Containers

Editor's Note:

The following data has been obtained from the American Silver Producers' Research Project which was organized to investigate and develop industrial uses of silver. It may be of interest where containers having non ferrous linings are required.

The present day tin can which has been a satisfactory metallic container for a vast number of purposes has always been somewhat limited in its application to chemicals. Tin is a good protector against atmospheric corrosion and an excellent liner for foodstuffs containers.

Silver can be substituted for tin as a container lining with the advantage that it is resistant to products which attack tin.

Silver is resistant to alkalies, organic acids and certain concentrations of hydrochloric and other mineral acids. Most organic silver salts are free from color, thus eliminating the objectionable discoloration of contents, even though traces of the silver may be dissolved. For that reason, silver has long found use for a variety of equipment in chemical manufacturing plants. Silver is also bactericidal and may be used in contact with food.

Silver can be applied to metal containers by electrodeposition on the sheet which can then be formed, soldered, etc. It can be applied from the very thinnest deposits (0.0001") up to very heavy thicknesses (0.05") with equal facility.

The cost of silver plating depends upon the following factors:

1. The condition of the basis metal: surface finish, freedom from impurities, pits, etc.

2. The finish desired: high polish or unpolished matte finish, etc.

3. The volume of output.

4. The mechanical equipment for handling the work: racks; full-automatic or semi-automatic cleaning, rinsing, plating, drying, etc.

5. The weight of the silver deposited: cost, approximately 28c per sq. ft. for 0.001" thickness. From this should be deducted the cost of the material which it replaces.

Interest in the use of silver-lined containers may be judged from the fact that they are being considered seriously for such products as foodstuffs, high grade beverages, beer, cola syrup concentrates, condensed milk, evaporated milk, salves and other antiseptic materials, ether, aluminum chloride and other chemicals.

From a manufacturing standpoint, the work of the Silver Producers' Research Project has indicated that:

1. Pore-free deposits of silver 0.001" on deep drawing steel are readily obtainable.

2. On suitable base metal, such as electroplated copper, pore-free silver deposits as thin as 0.0001" can be produced.

3. Deep drawing steel electroplated with ductile deposits of copper, nickel or silver, or any combination of these three metals, can be subjected to severe plastic deformation, cold rolling, press-forming and heating operations, without perforating initially pore-free deposits that have a total thickness of at least 0.002". (A copper undercoat at least 0.001" thick is recommended.) The methods described are applicable to the production of silver coated steel in large sheets.

4. Silver plated steel and objects fabricated from it, may be joined or assembled by the use of low temperature silver brazing alloys and induction heating, without recourse to a protective atmosphere.

Color Restrictions Off

Restrictions on the use of color in exterior coatings for steel drums of over two gallons capacity were removed on September 9th by the Director General for Operations.

The action was taken because the need for colored drums to identify products such as chemicals and explosives is greater than the stringency in pigments.

Other changes in drum coatings made by amendments to Order M-158 are:

Inks and lithographed materials may be used without restriction in drum coatings.

"Wash up salvage" coatings, the result of cleaning operations, which otherwise might be wasted, may be used without restriction.

Overrun or off-color salvage coatings may be used by special authorization of the Director. Restrictions on the use of coatings containing specified scarce materials other than pigments remain in effect.

BOOKLETS & CATALOGS

Chemicals

A418. *Acid Proof Cement.* 12 looseleaf sheets detail the engineering data, chemical constructions, characteristics, uses, and preparations of corrosion proof cements. Electro-Chemical Supply and Engineering Co., division of Ansul Chemical Co.

A419. *Butadiene 1:3, Storage of.* Research Bulletin No. 7.381-B is a report of the research work on the storage of 1:3 Butadiene undertaken at the Mellon Institute of Industrial Research. The importance of synthetic rubber to the war program and the lack of previous experience in the storage of the raw materials used in its manufacture led to a program of chemical and economic research. This bulletin describes the physical and chemical data, methods of preparation, etc. of 1:3 butadiene; information relative to the types of containers used in I. C. C. shipments, effect of butadiene on container materials, effect of container materials on butadiene, effect of light, air, oxidizing substances, and heat upon butadiene, and the effect of various catalyzers and inhibitors. It also includes charts of the various physical properties of butadiene and mild steel, economic studies of cost, drawings of types of tanks, and references. Chemical Storage Fellowship, Pittsburgh - Des Moines Steel Company.

A420. *Dyes.* The current quarterly issue of "Dyestuffs" (Vol. 37, No. 7) presents the illustrated abstract of the Jacob F. Schoellkopf medal address, "Detergents from Petroleum" by Lawrence H. Flett. This article traces the history of surface active agents from 1875, their production, and varied applications. Also included are reports on bleaching cotton knit goods, practical acid milling, and causes of uneven shades in wool goods dyeing. National Aniline Division, Allied Chemical & Dye Corporation.

A421. *Lignin Sulfonates.* Folder discusses in detail the chemical composition, physical properties, and varied uses of lignin sulfonates. Marathon Chemical Company, Division of Marathon Paper Mills Co.

A422. *Resins, Phenol-formaldehyde.* Illustrated 22-page booklet describes the chemical, physical properties, and applications of corrosion, acid, and alkali resistant industrial coatings, industrial baked finishes, air dry finishes, and laminating varnishes of the phenol-formaldehyde resin type. Molding powders, plywood adhesives, and cast resin (which can be machined) of the same basic synthetic resin are also discussed. Heresite & Chemical Company.

A423. *Rubber Substitute.* This bulletin on rubber-like ethyl cellulose compositions presents a detailed chart of the characteristics of these compounds, preparation of plastics for tests, description of tests, and discussion of the significance of these data. Hercules Powder Company.

A424. *Standard Solutions.* This handy folder lists and describes volumetric standards, standard reagents for water analysis and clinical chemistry, and indicators and buffer solutions. Eimer and Amend.

A425. *Staybelite Resin.* 8-page booklet charts the physical and chemical properties, solvents, and plasticizers for Staybelite Resin; graphs compare its rate of oxygen absorption with other resins. Discusses Staybelite's uses in rubber compounding, adhesives, resin mfg., fluxes, etc. Hercules Powder Co.

Equipment — Containers

E734. *Centrifugal Paper Stock Pumps*; Bulletin W-360-B1A. Folder describes Type FP centrifugal paper stock pumps. Worthington Pump and Machinery Corp.

E735. *Centrifugal Pumps.* Bulletin B6059-H describes and diagrams the construction features, sizes, and capacities for single and double suction, single and multi-stage, mixed and axial flow, combined units, and special pumps. Allis-Chalmers Mfg. Co.

E736. *Coal Crushers and Breakers.* New 20-page bulletin describes and illustrates the mechanical principles of crushers and breakers in relation to the crushing and breaking of coal sizes. Contains capacity and dimension charts, line drawings and diagrams, machinery pictures, phantom view, and construction features. Bulletin No. 342. McNally Pittsburg Mfg. Corporation.

E737. *Electric and Hand Power Lifters.* 32-page booklet illustrates and describes ball bearing lifters for paper handling, machine shops, die handling, stacking bales and crates, and handling drums and barrels. Includes narrow front, four post, balcony, low platform, and unequal floor lifters; also telescopers. Economy Engineering Co.

E738. *Electric Equipment for Synthetic-rubber Production*; GES-3016. New 52-page booklet emphasizes the part of electrical equipment in the progressive stages of synthetic rubber production. Divided into five illustrated sections: 1. Introduction and flow charts; 2. Power generation—turbines, turbine generators, and co-ordinated, metal-enclosed switchgear; 3. Power distribution—load center systems, co-ordinated master unit substations, drawout air circuit breakers and various types of cable; 4. Utilization equipment—mechanical-drive turbines, motor and process controls, protective lighting, diesel-electric switchers, and gear, synchronous, and explosion-proof induction motors; 5. General Electric service facilities. General Electric Co.

E739. *Health and Safety for Women.* Manual devoted exclusively to the problems of women in industry deals with new safety clothing, proper exercises, and occupational hazards, Attractive line drawings and photo-

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graphs of women's activities illustrate the text. Allis-Chalmers Mfg. Co.

E740. *Industrial Instruments.* The new 48-page catalog, 95-A, describes and illustrates instruments, accessories and supplies for the measurement and control of industrial process conditions, such as temperature, flow, pressure, level, and humidity. It also covers combination instruments, valves, instrument panels, etc. Cross-indexing and the use of colors increase the convenience of this handbook. The Foxboro Co.

E741. *Kjeldahl Equipment*; Bulletin 515. New 8-page illustrated booklet describes possible modifications and combinations of Precision Kjeldahl equipment for large or small laboratories. Precision Scientific Co.

E742. *Laboratory and Vocational Furniture.* New, 192-page catalog includes descriptions of the following types of equipment: instructors' desks, general science, biology, and physics laboratory equipment, combination class room desks and laboratory tables, chemistry tables, seating, sinks and plumbing accessories, wall tables and storage cases, fume hoods, home economics and industrial arts equipment, and miscellaneous laboratory equipment. Catalog No. 200. Hamilton Mfg. Co.

E743. *Lift-truck.* 18-page manual describes and illustrates the design, frame construction, lifting and stacking mechanism, power plant and travel mechanism, operation and control mechanism, and servicing and maintenance features of Towmotor. Presented in a clear, interesting fashion. Towmotor Co.

E744. *Lift-truck.* Two new circulars describe and illustrate industrial lift trucks of medium capacity. These trucks are of the tilting fork type, telescopic and non-telescopic, gas and electric powered models. Lewis-Shepard Sales Corp.

E745. *Lightweight Speedways Conveyor.* Folder illustrates methods for cutting handling costs and lists prices for various styles of conveyors. Chas. S. Jacobowitz Corp.

E746. *Lo-maintenance Motors.* In Bulletin B6052-C compact, simplified charts characterize rating, duty, torques, starting current, efficiency, and slip for each design and application relationship, for squirrel-cage, wound rotor, direct current, and synchronous motors. This manual also includes speed-torque curves, discussions of engineering phases of motor application, dimension ratings, and price lists. Allis-Chalmers Mfg. Co.

E747. *Maintenance Hints.* 8-page booklet outlines proper maintenance for Clark "Angle" super two-cycle gas engine driven compressors, including trouble-shooter's chart and methods for reducing repair costs. Clark Bros. Co., Inc.

E748. *Nickel.* The current issue of "Inco" (Vol. 18, No. 3) presents information on the wartime use of nickel, Monel, and other nickel alloys. Illustrated articles describe technical research and experience mobilized on the field, simple tests to identify white metals, alloying without additions, and various other national emergency applications of alloys. The International Nickel Company, Inc.

E749. *Power Plant Equipment*; Catalog No. 142. New 24-page bulletin contains technical data and illustrations on pump valves, water gauges, steam pump governors, gauge cocks, ball-type high pressure steam traps, safety feed water regulators, high and low alarm columns, flanged silent check valves and standard feed regulators. The Williams Gauge Co.

E750. *Precipitrons for War Industry.* Describes the operation of the Preciptron, electric air cleaner, and its outstanding applications, supplemented by illustrations and cutaway views of the power pact, the cells, and a typical air duct. Booklet B-3083. Westinghouse Electric and Mfg. Co.

E751. *Rubber Conservation,* for users of industrial rubber belting. New illustrated step-by-step procedure booklet discusses saving rubber by making vulcanized repairs promptly, salvaging belts for smaller drives, using the plylock splice, and by proper care. The B. F. Goodrich Co.

E752. *Rubber V-belts.* New, simple handbook—"Plain Facts on Wartime Care of Rubber V-belts"—describes and illustrates the anatomy, maintenance, proper tension, worn sheaves, and life-expectancy of V-belts. Allis-Chalmers Mfg. Co.

E753. *Scrap* and how to collect it. This interesting, informal booklet discusses the vital role of scrap in winning the war. Attractively illustrated with photographs and sketches, it explains what scrap is, where to look for it, and how it is used. It outlines the organization and work of the rural, local, state, and national salvage committees, and of the Conservation Division of the War Production Board. American Industries Salvage Committee.

E754. *Special Steels, Their Properties and Uses.* This 127-page revised edition, particularly adapted for use by design engineers and production men, contains complete data for guidance in the proper selection, treatment, and use of the various grades of stainless, tool, and other special alloy steels.

Included are suggestions for selecting the proper grades of tool steels, and information on drill rod with a list showing sizes, weights, and prices. The handbook details engineering tables and other data on Nitralloy Steels, Stainless Steels, Show Die Steel, Silcrome Valve Steels, and Special Shapes, with a discussion of the Pluramelt technique, Electrical Steels and Carbon Steels.

E755. *Steel Fittings*; Bulletin A-3, Edition 11. 166 different kinds of forged steel fittings now available through distributors are described in profusely-illustrated reference book which stresses the advantages of forged steel fittings in high-pressure, high-temperature service.

E756. *Steel Insulation.* Comprehensive bulletin discusses and illustrates with graphs and blueprints the Ferro-therm steel insulation for refrigerated construction. Includes data reports by testing laboratories and authorities. American Flange & Mfg. Co., Inc.

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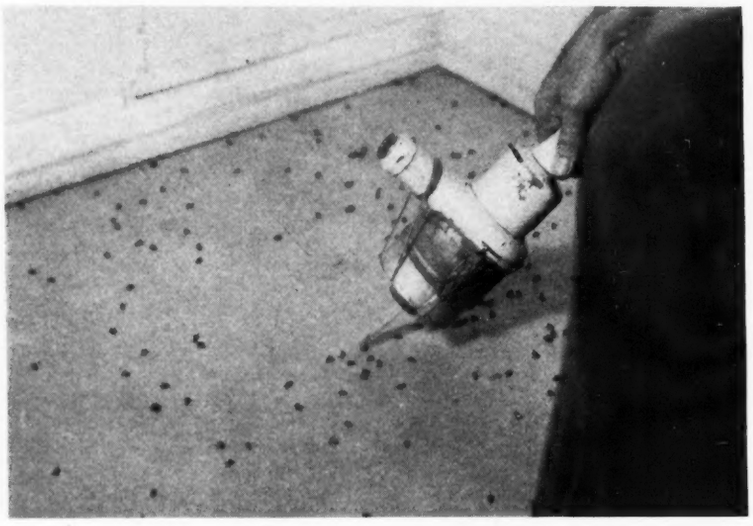
CHEMICAL SPECIALTIES

Rad, a new all-purpose cleaner in paste form was introduced recently by Milrose Products Co., N. Y. City. One tablespoonful in a gallon of water is the usual all-round home cure-all as far as general cleaning is concerned. Cleans almost anything from upholstery and rugs to porcelain fixtures et cetera.

Industrial Agricultural Household

thanite

a new HERCULES *insecticide concentrate*



After each test the flies knocked down are picked up and counted; then retained for determining recovery.

HOW many flies does it take to worry a cow? Maybe 20 to 25, or perhaps 40 to 50—it depends upon the size and temperament of the cow, say the experts. But one fly can worry almost any size of man, as all of us know. And because flies and other insects are so troublesome to man and dangerous to his health, manufacturers of insecticides are always on the alert for new and proved materials. Today such interest is acute because of the foreign situation.

Thanite is now being produced commercially by Hercules Powder Company from plentiful domestic raw materials derived from the Southern pine. This stable insecticide is effective at low concentrations and requires no other agent or activator than a suitable base oil to make high-grade insecticides.

Throughout the past three years, chemical and entomological research men and chemical engineers in Hercules Powder Company laboratories and pilot plants have been making, testing, trying, and improving Thanite. Concurrently, in state experiment stations, Thanite has been tested for insecticidal value. In toxicological laboratories it has been checked by toxicologists for possible toxic properties toward laboratory animals and humans.

What Is Thanite?

Most contact insecticides produced in this country have contained, as their active ingredients, pyrethrum or rotenone, derris or cubé resins, all of which come from foreign sources. Today, with some sources of supply completely shut off (as that of Japanese pyrethrum), with all shipping so uncertain, and with need for insecticides during war times as great or greater than ever, availability of a new, economical, and highly effective insecticide from domestic sources should be welcome news to both producer and user of insecticides. Production of Thanite for fly sprays and livestock sprays helps put the American insecticide industry in a much better position; pyrethrum, rotenone, derris, and cubé may thus be diverted to agricultural dusts and sprays for use in the protection of food crops.

Is It Effective?

Thanite at 2.5 per cent concentration in suitable base oils passes the official Peet-Grady test of the National Association of Insecticide and Disinfectant Manufacturers for insecticides of AA Grade. Its effectiveness at this and other concentrations is illustrated by data given in Table 1. A concentration of Thanite as low as 1.75 per cent will give an insecticide of B grade. From the data, a spray containing a 2.5 per cent. concentration can be depended upon, under conditions of the Peet-Grady test to grade AA, knocking down over 99 per cent of all flies by the end of 10 minutes, 59 per cent of which will be dead at the end of 24 hours, and at least 75 per cent of all flies will, in this time, be dead or dying. A concentration of 5 per cent. of Thanite can be expected to kill 94 to 98 per cent. of all sprayed flies.

Sprays containing 2 per cent Thanite have been found effective against insects other than flies, such as mosquitoes, bedbugs, roaches, moths, ants, fleas, and silver fish.

An interesting fact uncovered by entomologists during their studies is that Thanite sprays kill female flies as readily as male flies. The female fly is said to be more resistant than the male to many toxic contact agents used in fly sprays. This better performance of Thanite sprays against female flies means a smaller number of eggs laid when Thanite is used.

Is Thanite Good for Livestock Sprays?

Wherever Thanite has been used in sprays for livestock, it has been found to impart an unusually high repellency, as well as to give a good knockdown and kill. Data in Table II are given to show the relative repellent effectiveness of a 3 per cent Thanite spray as compared to three commercial sprays, considered to be of good grade.

Four balanced groups of four dairy cows each (i. e., Jersey, Ayrshire, Guernsey, and Holstein) were used. All cows in each group were susceptible to attack from flies. Each spray was applied to each group for one day, the length of time for the complete test being four days. Figures in the table for average number of flies per group of four cows represent daily averages for four days for each spray.

Groups of other cows in adjacent fields during the four days of this test were observed to determine if flies were feeding. Flies were found to be feeding each day, with peak numbers of feeding flies occurring after the third and fifth hours of tests.

From examination of data in Table II, it appears that all four sprays were quite effective for one hour after spraying, and for two hours, Thanite and commercial spray No. 3 were more effective than Nos. 1 and 2, with Thanite being out-

TABLE I

Efficiency of Thanite Sprays by the official Peet-Grady Test

Base Oil	Thanite Content	% Down in 10 min.	% Dead 24 hrs.	Rating	Grade	% Dead and Moribund† in 24 hrs.	Rating	Grade
No. 1*	1.75%	98.4	41.2	+ 0.8	B	51.0	+ 9.9	A
No. 1	2.00%	98.9	52.4	+12.4	A	65.3	+24.7	AA
No. 1	2.50%	99.2	59.5	+19.1	AA	75.4	+34.3	AA
No. 1	3.00%	99.7	65.2	+24.8	AA	83.1	+42.0	AA
No. 1	5.00%	100.0	86.1	+41.6	AA	94.6	+48.7	AA
No. 2**	1.50%	94.8	56.6	+ 3.7	B	no additional kill		
No. 2	2.50%	99.5	78.5	+25.6	AA	no additional kill		
No. 2	5.00%	99.6	89.8	+36.9	AA	98.8	+44.8	AA

* No. 1 Base oil, deodorized kerosene.
** No. 2 Base oil, 50-viscosity white oil.
† "Moribund" indicates flies paralyzed but not yet dead.

TABLE II

Relative Repellency of Four Fly Sprays
(Average number of feeding flies per group of four cows)

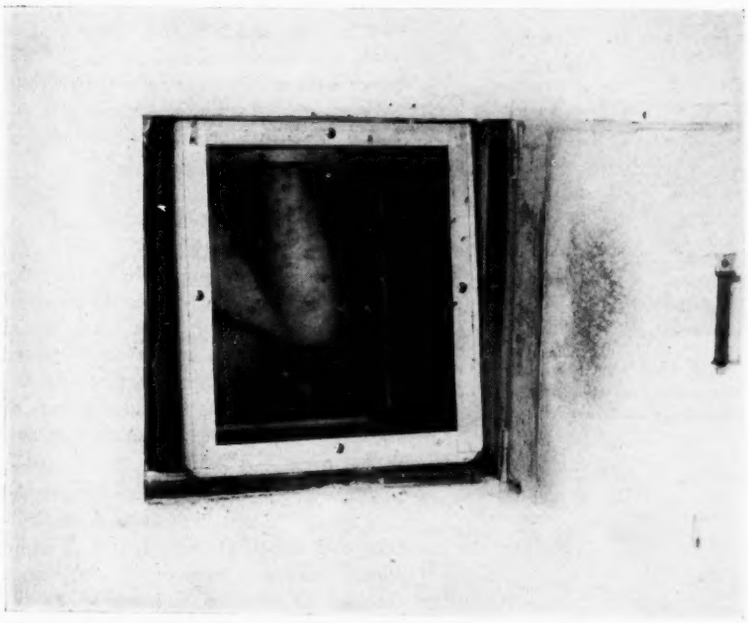
Spray	Hours after application of sprays							
	1	2	3	4	5	6	7	8
Commercial No. 1	40	65	140	145	135	140	100	110
Commercial No. 2	35	60	105	95	105	75	95	120
Commercial No. 3	25	55	110	90	95	80	105	110
Thanite—3%	25	35	85	70	70	70	100	125

TABLE III

Chemical and Biological Uniformity of Thanite
Sulfur content and killing power of 2.5% fly sprays from nine consecutive plant batches

Batch No.	Chemical % Sulfur	% down* in 10 min.	Biological, Peet-Grady Test, Dead in 24 hours			Dead in 48 hours		
			% dead	Rating	Grade	% dead	Rating	Grade
18	10.9	99	72.2	+23.1	AA	86.7	+37.6	AA
19	11.4	100	66.7	+17.4	AA	85.9	+36.6	AA
20	10.6	99	70.1	+22.1	AA	86.5	+38.5	AA
21	11.0	99	67.9	+19.2	AA	82.0	+33.3	AA
22	11.3	99	70.0	+16.2	AA	88.2	+34.4	AA
23	11.3	100	68.6	+20.7	AA	83.5	+35.6	AA
24	11.1	100	62.9	+16.3	AA	82.0	+35.4	AA
25	11.5	99	63.7	+17.1	AA	83.1	+36.4	AA
26		100	65.4	+16.3	AA	83.1	+36.5	AA

* Fractions of a per cent between 99 and 100 not given.



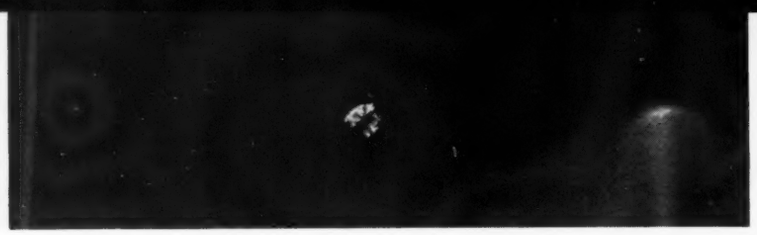
Flies being released into the Peet-Grady Chamber from their cage, for testing purposes at the University of Delaware Experiment Station, where Hercules sponsors a fellowship for testing fly sprays.

standing in relative repellency. At the end of the third hour, it appears that No. 1 spray had lost its effectiveness while Nos. 2 and 3 still retained some repellency but not as much as Thanite. Counts at the end of the seven-and eight-hour periods indicate that all sprays were about equal in repellency, or all repellency for each spray had gone.

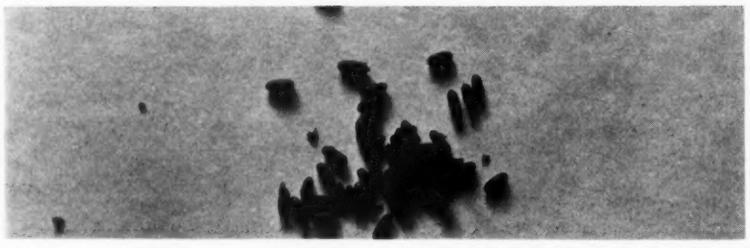
Is It Safe?

A complete series of acute and subacute tests have been conducted in one of the leading toxicological laboratories of this country to determine toxicity of Thanite to laboratory animals and humans. On the basis of these tests, toxicologists have concluded that Thanite in a suitable base oil can be safely used as an insecticide.

The observations made in extended fly-spray tests on herd milk cows check data on laboratory animals in the toxicology laboratories. No observable differences were noted on any of the test animals as compared to those not receiving Thanite sprays. Checking for possible toxicological effects included body-tem-



These jars contain fly larvae in their varied stages. When they reach the pupal stage, they are removed from the jars and placed in the cages to mature.



The pupal stage lasts from three to five days. From this stage emerge the adult flies.

The eggs develop into maggots in one day, remaining in this stage from four to six days.

When about three or four days old, the fly begins laying eggs. There are approximately 1,000 in this small cluster.

Those flies picked up after a test are placed in a cage with sugar and water for food. The number of flies which revive are noted at 24-hour and 48-hour intervals. The number which are killed determine the efficiency of the insecticide.

Adult flies killed in testing the effectiveness of Thanite.

perature readings and milk production. No symptoms of harmful effects of any sort from Thanite sprays have been observed at any time during the many tests made to date.

Is Thanite Uniform in Quality?

Each batch of Thanite produced in the Hercules plant must pass rigid chemical and biological tests. Data in Table III were obtained in routine check tests on nine consecutive plant batches and illustrate the consistently high chemical and biological uniformity of Thanite as supplied to insecticide manufacturers.

The sulfur content is a chemical measure of the uniformly high thiocyanate content of Thanite. Nitrogen content as determined by the Kjeldhal method can also be used for checking thiocyanate content and purity.

As indicated by the Peet-Grady test data in Table III, a 2.5 per cent Thanite concentration in a suitable base oil consistently gives a high knockdown (99+). At this concentration, Thanite has been found to consistently give an AA rating. All material shipped must show a rating of AA at 2.5 per cent concentration and a sulfur content of at least 10.5 per cent.

Is It Chemically Stable?

Thanite is a terpene insecticidal compound not affected by oxygen of the air, or by sunlight as are the pyrethrum and rotenone types of insecticidal materials. Thanite sprays have been treated for storage stability. No loss of strength of Thanite sprays was found on storage in flint glass bottles, even in direct sunshine. Metal containers made of, or lined with tin plate and aluminum, were not affected in these storage tests.

Thanite sprays prepared in proper base oils are water-white and cause neither stains nor discoloration of fabrics or wallpaper with which these sprays may come in contact. Thanite in sprays will not soften the usual protective finishes use on wood and metal.

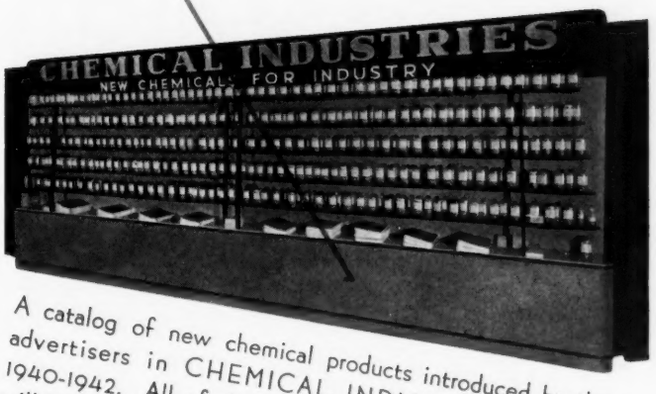
What About Availability and Economy?

Thanite is now being made by Hercules Powder Company in its recently enlarged pilot plant, in which sufficient material can be produced to satisfy the expected demands. It is supplied in the undiluted form as a concentrate to manufacturers of fly, livestock and other insecticidal sprays.

Thanite sprays offer no manufacturing problems. Its cost is very reasonable. The low cost, plus high knockdown, killing, and repellent activity of Thanite sprays, makes it possible for the manufacturer to produce and supply sprays with an unusual combination of economy and efficiency.

NCI

New Chemicals for Industry



A catalog of new chemical products introduced by the advertisers in CHEMICAL INDUSTRIES during 1940-1942. All of these "New Chemicals for Industry" will be on display at CI's booth, 1942 National Chemical Exposition, Sherman Hotel, Chicago, November 24-29.

PROGRAM
NATIONAL CHEMICAL EXPOSITION

Wednesday, Nov. 25, 2-4 P.M.

"PLASTICS AND PAPER," Presiding, NORMAN L. SHEPARD, Chemical Director, American Cyanamid Company, N. Y. City.

"Raw Material Supplies for Plastics Manufacture" By ARTHUR E. PETERSEN, Chief of Organic Plastics and Resins Section, Materials Division, Chemical Branch, War Production Board, Washington, D. C.

"Paper and Paper Materials" By ALLEN ABRAMS, Vice-President in Charge of Research and Development, Marathon Paper Mills Company, Rothschild, Wisconsin.

Thursday, Nov. 26, 6:30 P.M.

Joint meeting of the National Industrial Chemical Conference and the Chicago Section of the American Chemical Society. Presiding, R. C. NEWTON, Vice-President, Swift & Company, Chicago, Illinois.

"The Electron Microscope in Relation to Chemical Research" By V. K. ZWORYKIN, Associate Director, Research Laboratories, RCA Manufacturing Company, Camden, New Jersey.

"FOOD AND THE RELATION OF FOOD TO THE CHEMISTRY OF PLANTS AND THE SOIL," Presiding, C. G. King, Scientific Director, The Nutrition Foundation, Inc., N. Y. City.

"The Soil and Crop Basis of Better Nutrition," By L. A. MAYNARD, Director, School of Nutrition and the United States Plant Soil and Nutrition Laboratory, Cornell University, Ithaca, New York.

"Soil Fertility and the Human Species," By W. A. ALBRECHT, Chairman, Department of Soils, College of Agriculture, Columbia, Missouri.

"Food and Nutrition as Related to War," By C. G. KING, Scientific Director, The Nutrition Foundation, Inc., N. Y. City.

Friday, Nov. 27, 2-5 P.M.

Presiding, VICTOR CONQUEST, Director of Research, Armour & Company, Chicago, Ill.

"The Cyclotron and Its Uses in Research," By P. GERALD KRUGER, Department of Physics, University of Illinois, Urbana, Ill.

Saturday, Nov. 28, 1:45-5 P.M.

"A SYMPOSIUM ON INDUSTRIAL WAR PROBLEMS," Presiding, C. S. MINER, Director, Miner Laboratories, Chicago, Ill.

"Control of War Time Incendiaries," By WARD V. EVANS, Professor of Chemistry, Northwestern University, Evanston, Ill.

"Waste Treatment in Industry as Related to War Economy," By F. W. MOHLMAN, Director of Laboratories, Sanitary District of Chicago, Chicago, Ill.

"The Salvage and Conservation of Chemicals in Industry," By S. DONALD PERLMAN, Executive Chemical Director, Industrial Salvage Section, Conservation Division, War Production Board.

INDUSTRIAL MOVIES

A continuous program of industrial movies will be shown during the National Chemical Exposition as an educational feature.

These movies will provide a liberal education in chemical processing. These films show interesting features in the manufacture of plastics, rayon, chemical stoneware, glass, bread, coke, white lead, canned foods, glass insulators, gelatin capsules, steel and aluminum, as well as miscellaneous subjects related to chemistry in the field of photography, natural resources and special plant construction.

This feature of the exposition was so well received in 1940 that efforts are being made to expand and improve it. Some subjects are treated quite technically and others are less specialized, so that there will be something of interest to all.

SCIENTIFIC EXHIBIT

The "Electronic Microscope" is to be exhibited by the RCA Manufacturing Company. It is expected that the device will be on demonstration and that you will be able to see an actual magnification.

Micrographs from the Electronic Microscope will be on display. All users of the Electronic Microscope will be invited to provide copies of their most successful magnifications.

FIRST AID FOR SECOND DEGREE BURNS...

"triple dyes"

Boon to mankind is the new "triple dye" treatment that saves lives and prevents disfigurement, particularly in burns of the face and extremities.

Typical formulation is a solution of Gentian Violet 2%, Brilliant Green 1% and Acriflavine 0.1%. Applied directly to the burned areas, these beneficient dyes relieve pain, produce the desired "tan" (eschar), prevent loss of blood plasma and have definite bactericidal action on the streptococci so often found in burned tissue.

These and many other National Dyes used in public health protection are made to the exacting standards of the medical profession in National Pharmaceutical Laboratories. They are examples of how National Research is expanding the application of dyestuffs, intermediates and synthetic organic chemicals to better serve science and industry.

NATIONAL ANILINE DIVISION

ALLIED CHEMICAL & DYE CORPORATION

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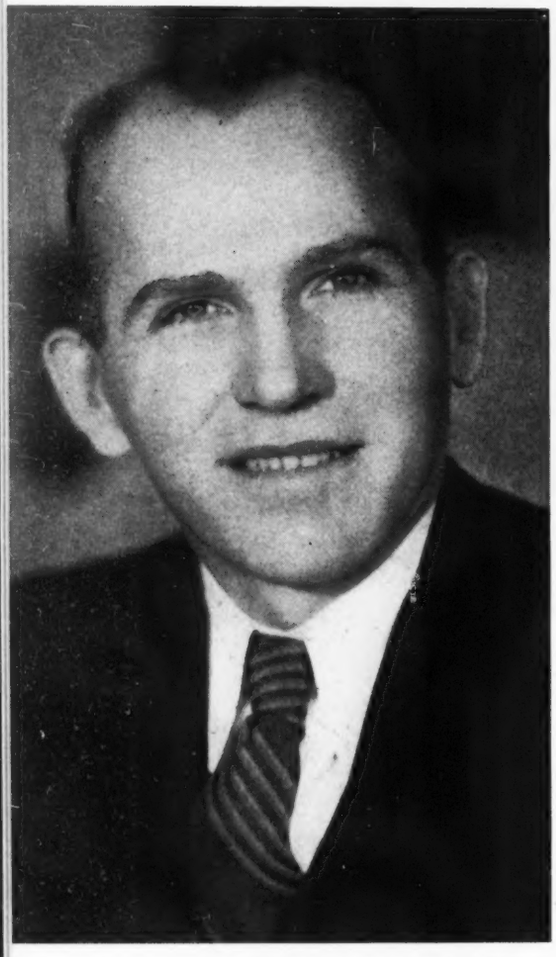

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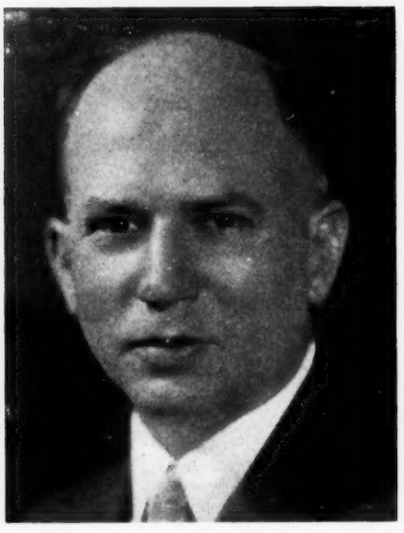

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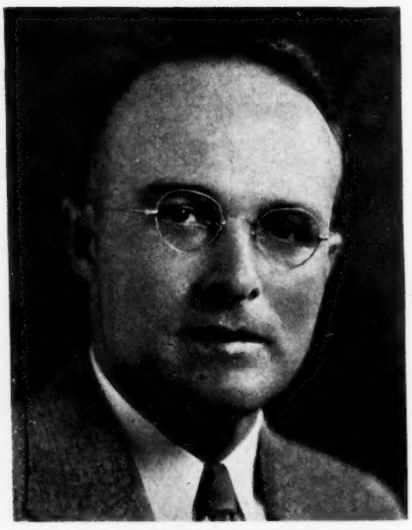


H. E. Robinson
Swift & Co.

New Chemicals for Industry

A catalogue of New Chemical Products introduced during 1940-1942 by the advertisers in Chemical Industries Magazine and displayed at the National Chemical Exposition, Hotel Sherman, Chicago, Ill., Nov. 24-29.

ACETOACET-o-TOLUIDIDE

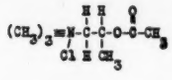
$CH_3COCH_2CONHC_6H_4CH_3$. Mol. Wt., 191.22. Melts at 106°C. Solubility in water slight. Fine, white granular powder. Resembles ethyl acetoacetate in chemical reactivity. Related structurally to the other acetoacetyl compounds. Uses, in the preparation of Hansa type azo dyestuffs. The compound combines with diazotized aromatic amines in a manner analogous to acetoacetanilide giving colors having a slightly different tone or shade. Carbide and Carbon Chemicals Corporation.

p-ACETYL AMINOBENZENE SULFONCHLORIDE

Empirical formula, $C_8H_8O_3NSCl$. Mol. Wt., 233.6 Assay, 97.5% min. Odor, slightly acetic. Appearance, light tan to brownish powder or fine crystals. Suggested uses, intermediate in chemical synthesis. Available in commercial quantities. Monsanto Chemical Co.

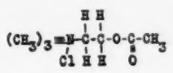
ACETYL BETA METHYL CHOLINE CHLORIDE (Acetyl Beta Methyl Choline Bromide)

Mol. Wt., 195.61. White, odorless, very deliquescent powder. Very soluble in water and alcohol with hydrolysis. Uses, in pharmacy as a parasympathetic stimulant. Organic Products Co.



ACETYL CHOLINE CHLORIDE

Mol. Wt., 181.59. White, odorless, hygroscopic crystals. Very soluble in cold water, and alcohol with hydrolysis; insoluble in ether. Uses, in pharmacy as a vaso-dilator. Organic Products Co.



ACID ANHYDROMETHYLENE CITRIC

Empirical formula, $C_7H_8O_7$. Mol. Wt., 204.13. M. P., 206-208°C. White crystalline powder. Solubility, soluble in 20 parts of cold water, freely in hot water, acetone, chloroform. Sparingly soluble in alcohol; soluble in alkalies. Uses, medicinal, organic synthesis. Availability, stock. The Edwal Laboratories, Inc.

ACID dl-ASPARTIC

Empirical formula, $C_4H_7O_4N$. Mol. Wt., 133. Appearance, a white crystalline solid; is only slightly soluble in water at room temperature and appreciably soluble in water at its boiling pt. A dicarboxylic acid mono basic material. Available only in small quantities for experimental investigation. Monsanto Chemical Co.

ACID, 2, 2, 3 TRICHLOROBUTYRIC; BUTYL ESTER OF

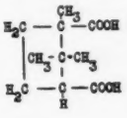
$CH_3.CHCl.CCl_2.COOC_4H_9$. Mol. Wt., 247.5. Density, 1.234. Refractive Index, 1.462 at 20°/4°C. B. P., 102°C. at 6 mm. Miscible with all organic solvents; practically insoluble in water. The substance is a typical ester. The halogen atoms are reactive. Suggested uses, where fragrance is desirable and as an intermediate. Pennsylvania Salt Mfg. Co.

ACID CACODYLIC

$(CH_3)_2AsO.OH$. Mol. Wt., 137.96. White odorless crystals. M. P., 198-200°C. Useful in the separation of the rare earths and as a source of the dimethyl arsenic group. Starting material for the preparation of its salts which are of medicinal value. Edcan Laboratories.

ACID d-CAMPHORIC

Mol. Wt., 200.12. White odorless crystalline powder. Sp. Gr., 1.186. M. P., 186-188°C. Soluble alcohol, glycerine, ether, boiling water. Insoluble cold water. Uses, in manufacture of camphoric esters and in pharmacy. Organic Products Co.



CHEMICAL INDUSTRIES

With the publication and subsequent exhibit of "New Chemicals for Industry" Chemical Industries plays its part in the present scheme of things by bringing forth a check-list of American chemical progress in the past two years. Among the "New Chemicals for Industry of 1942" there will be many which in a year, two years or five years will be highly essential to industry. There will be many, too, which will solve some of the complex problems of substitution brought on by the demands and limitations of war. Be sure to visit CI's booth at the show (76, 76A and 77) to discuss these new chemical products with our editors. A cordial welcome awaits you.

ACID Alpha-CHLOROCROTONIC

$CH_3.CH = CCl.COOH$. Mol. Wt., 120.5 M. P., 99-100°C. Soluble in organic solvents and water. It is a relatively weak acid but blisters the skin. Suggested uses, as a tanning assistant and intermediate. Pennsylvania Salt Mfg. Co.

ACID ETHYL PHOSPHORIC

Sp. Gr., 1.33 @ 25°C. Alkyl acid content, approx. 97%. Appearance, pale straw colored liquid. Suggested uses: patents have been issued which indicate value as catalyst and polymerizing agent in mfg. of resins; as polymerizing agents in the processing of drying oils; as water insoluble, rust- and corrosion-proofing compounds. Available in experimental quantities. Monsanto Chemical Co.

ACID; 2, 2, 3 TRICHLOROBUTYRIC; GLYCOL MONO ESTER OF

$CH_3.CHCl.CCl_2.COOCH_2.CH_2OH$. Mol. Wt., 235.5. Density, 1.413 at 20°/4°C. Refractive Index, 1.487 at 20°C. B.P., 153°C. at 15 mm. Soluble in organic solvents; practically insoluble in water. The substance is a typical ester and contains a free hydroxy group. Suggested uses, as a plasticizer and intermediate. Pennsylvania Salt Mfg. Co.

ACID HYDROXYACETIC (Acid Glycollic)

$HOCH_2COOH$. M. P. 80°C. A synthetic organic acid derived from coal, air, and water by high pressure synthesis. Strength approximates that of lactic and formic acids. Non-toxic, non-volatile, readily soluble in water. Bifunctional, it exhibits the properties of both acids and alcohols. Suggested uses, acidification of foodstuffs, beverages, pharmaceuticals, cosmetics, and photographic chemicals. Available in small quantities for experimental investigations only. E. I. du Pont de Nemours & Company (Inc).

ACID HYDROXYACETIC (70% Technical Grade)

$HOCH_2COOH$—70%. (Glycollic Acid). A synthetic organic acid derived from coal, air, and water by high pressure synthesis. Contains 30% water, plus a small quantity of impurities. Strength approximates that of lactic and formic acids. Non-volatile and readily soluble in water. Bifunctional, it exhibits the properties of both acids and alcohols. Uses, tanning of leather, dyeing of leather and textiles, metal treatment, acid dairy detergency, rubber coagulation, and organic synthesis. Available in commercial quantities. E. I. du Pont de Nemours & Company (Inc).

ACID METHOXY CHLOR DIPHENYLAMINE CARBOXYLIC

$C_{14}H_{12}O_3NCl$. Mol. Wt., 277.60. Yellow powder. M. P., 217-218°C. Uses, intermediate for dyes and medicinal chemicals. Heyden Chemical Corp.

ACID NAPHTHALENE-1, 2-DIAZOOXIDE-4-SULFONIC

Empirical formula, $C_{10}H_6N_2O_4S$. Mol. Wt., 250.1. Yellow-brown crystals quantitatively decomposed by light. Solubility, soluble in water. Use, diazo type papers. Availability, stock. The Edwal Laboratories, Inc.

ACID 2-PHENYL BUTYRIC

Empirical formula, $C_{10}H_{12}O_2$. Mol. Wt., 164.1. Light gray crystals. M. P., 41-42°C. B. P., 270-272°C. Solubility, insoluble in water. Soluble in alcohol and ether. Use, organic syntheses. Availability, made up to order. The Edwal Laboratories, Inc.

ACID SACCHARIC—40%

Empirical formula, $COOH\text{-}(COOH)_4\text{-}COOH$. Mol. Wt., 210. Miscible with water, alcohol, and ether in any proportion. Acidity, ml. n. NaOH, gm. 9.52. Odor, fruity. Color, amber to wine red. Chemical properties: dibasic, very similar to d Tartaric Acid, dextro rotation, forms Gamma lactones easily, caramelizes like sugar. Suggested use, substitute for d Tartaric Acid, Citric and Lactic Acids, especially in food industries, for preparations of sour candies, lemonades, wines. Tobacco curing. Availability, in any quantities. Brocker Chemical Co.

ACID SACCHARIC—80%

Empirical formula, $COOH\text{-}(CHOH)_4\text{-}COOH$. Mol. Wt., 210. Miscible with water, alcohol, and ether in any proportion. Acidity, ml. n. NaOH, gm. 9.52. Odor, fruity. Color, amber to wine red. Dibasic, very similar to d Tartaric Acid, dextro rotation, forms Gamma lactones easily, caramelizes like sugar, contains about 10% Gamma lactone, very hygroscopic. Suggested use, substitute for d Tartaric Acid, Citric, and Lactic Acids, especially in food industries, for preparations of sour candies, lemonades, wines. Tobacco curing. Availability, will be available in commercial quantities in the near future. Brocker Chemical Co.

ACID; 2, 2, 3 TRICHLOROBUTYRIC

$CH_3.CHCl.CCl_2.COOH$. Mol. Wt., 191.5. Density, 1.49 at 60°C. Refractive Index, 1.472 at 60°C. B.P., 115°C. at 10 mm. M.P., 60°C. Soluble in all organic solvents. With water it first forms a separate liquid phase containing 66-69% acid, which then dissolves in additional water. The acid is somewhat stronger than trichloracetic acid and forms many esters and metallic salts. Suggested uses, as an alternative for trichloroacetic acid and an intermediate. Pennsylvania Salt Mfg Co.

ACROLEIN

Empirical formula, C_3H_4O. Mol. Wt., 56.06. B. P., °C. (760 mm.); 52.1. Density, 20/4°C. 0.8389. Flash-point, 13°F. Solubility in water, % at 0°C.; 20. Colorless liquid of exceedingly pungent odor. Acrolein is a very reactive compound owing to the presence of a terminal double bond in conjugated position to the aldehyde group. Uses, as a warning agent in refrigerants. Acrolein is very interesting as a polymerizable material. Now available only in small quantities for experimental work. Produced by Shell Development Co., Selling Agent, R. W. Greeff & Co., Inc.

ACRYL 11

Acrylic type. Extremely flexible and resistant to ageing. Used as a binder for pigments in finishing of leather and artificial cloth. Improves adhesion, fill and brightness. Impregnant for paper to make artificial leather. Possesses fine particle size which averages less than one-half micron. Available in modifications to confer increased fire and water resistance. American Resinous Chemicals Corporation.

ACRYL HPP 45

Latex replacement. Highly flexibilized acrylic. Used for impregnating paper as an adhesive base particularly for tapes. High solids and high viscosity. Permanent tack. American Resinous Chemicals Corporation.

AEROLUBE

A combined antioxidant and detergent for use in automotive lubricating oils. Aerolube is adaptable for use in a variety of lubricating oil stocks for various types of engine service ranging from Medium Duty Automatic Service to Heavy Duty Diesel and Gasoline Engine Service. Suitable combinations of Aerolube with lubricating oil stocks are developed in cooperation with lubricant manufacturers. American Cyanamid & Chemical Corp.

AEROSOL 18

A paste containing 35% active ingredient, 65% water. An acid and alkali resistant surface active agent possessing detergent, emulsifying, dispersing and foaming properties. Low solubility in organic liquids, sufficiently soluble in water and low concentrations of electrolytes for practical use. American Cyanamid & Chemical Corp.

Aerosol 18 (Cont'd)

AEROSOL 22

An acid and alkali resistant surface active agent in pure form containing no diluents. Extremely high solubility in water, and in some cases, saturated solutions of electrolytes. Unusually powerful dispersing agent for aqueous systems. Solubilizes soap in sea water, maintaining its efficiency to a high degree. Low solubility in organic liquids. Has excellent foaming and detergent properties also. American Cyanamid & Chemical Corp.

B-ALANINE (B-Aminopropionic Acid)

$NH_2CH_2CH_2COOH$. Mol. Wt., 89.1. M. P., 202-203°C. Flash Point, above 200°F. Color and form, white crystalline. Odor, odorless. Very soluble in water; very slightly soluble in methyl alcohol. Insoluble in ethyl ether, benzene, naphtha, and ethyl acetate. Uses, for synthesis of pantothenic acid, which is a member of the Vitamin B complex. Availability, experimental quantities. Sharples Chemicals Inc.

ALKYD 16

Ester gum emulsion designed for use as low cost filler, size or extender. American Resinous Chemicals Corporation.

ALKYD 17 A

Latex extender. A highly plasticized alkyd type resin. Permanently tacky. Principal use is as extender for latex for adhesive purposes in ratios varying from 20 to 75%. When mixed with 40% latex in equal amounts, the mixture is for all practical adhesive purposes indistinguishable from latex. Finds extensive use in the extension of reclaim or resins for impregnation of paper and paper board. Available in concentration of either 40% or 50% solids. American Resinous Chemicals Corporation.

ALKYD 18 A

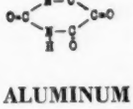
A flexibilized alkyd. Permanently tacky and non-yellowing and useful for adhesive purposes in admixture with latex similarly to Alkyd 17A but where non-staining features are necessary. Used extensively for impregnation of paper and paper board where maximum tensile strength is desired. Improves binding properties of starches, casein, gum sizes. Sealer for plaster, wall board or concrete. Available as 40% or 50% and with varying degrees of tack. Available also in solvent-free form. American Resinous Chemicals Corporation.

ALLANTOIN

Empirical formula, $C_4H_6O_3N_4$. Mol. Wt., 158.1. M. P., 228-230°. White crystals. Solubility, soluble in 15 parts of water. Use, medicinal. Availability, made up to order. The Edwal Laboratories, Inc.

ALLOXAN

Mol. Wt., 214.09. White crystals. Decomposes at 170°C. Freely soluble in water, alcohol. Used in organic syntheses; also in cosmetic industry. Organic Products Co.



ALUMINUM ISOPROPOXIDE (Aluminum Isopropylate)

$Al(OCH(CH_3)_2)_3$. Mol. Wt., 204.23. Boiling range, 134-136°C./4 mm. M. P., 118°C. White, strongly hygroscopic crystals, solubility, decomposed in cold water, soluble in benzene. Use, reagent for oxidations and reductions. Availability, made up to order. The Edwal Laboratories, Inc.

For your convenience in asking for more information on these products use coupon on page 573.

ALUMINUM METAPHOSPHATE

$Al(PO_3)_3$. Mol. Wt., 263.91. Appearance, white crystalline powder. M. P., above 1700°C. Solubility, insoluble in water, practically insoluble in acids. Suggested uses, constituent of glasses, chinaware and porcelains. Available in limited quantities. Monsanto Chemical Co.

ALWAX SIZE 270

A water dispersible wax emulsion designed primarily for preventing the absorption of water by asbestos fiber. The material is applied as an internal sizing agent in the paper making process. The product is of particular interest for the production of asbestos paper requiring an extremely low degree of water absorption.

The product is not limited in use to asbestos fibers. Excellent results have been obtained with cellulose fibers where it is desirable to have a sheet free of rosin, such as photographic paper. American Cyanamid & Chemical Corp.

AMINOBENZTHIAZOLE (2-Amino-benzothiazole)

Empirical formula, $C_7H_6N_2S$. Mol. Wt., 150.19. M. P., 122-125°C. Solubility, insoluble in water, soluble in dilute acid, very soluble in methanol. Uses, polymerization accelerator, organic synthesis. Availability, made up to order. The Edwal Laboratories, Inc.

o-AMINODICYCLOHEXYL

Empirical formula, $C_{12}H_{23}N$. Sp. Gr., 0.94 @ 25/25°C. Mol. Wt., 109. Refractive index, 1.5 @ 25°C. Boiling pt., 270°C. atmospheric pressure. Appearance, colorless liquid. Suggested uses, as an intermediate or in reactions where an essentially water insoluble strong primary amine may be required. Available only in small quantities for experimental investigation. Monsanto Chemical Co.

o-AMINODIPHENYL, TECHNICAL

Empirical formula, $C_{12}H_9NH_2$. Mol. Wt. 169. Crystallizing pt., 47.0°C. min. Appearance, purplish crystalline mass. Suggested uses, in resin compositions. In the manufacture of quinoline yellow type dyestuffs. Can be substituted for aniline oil in some applications. Available in commercial quantities. Monsanto Chemical Co.

2-AMINO-5-HYDROXY DIPHENYL

Empirical formula, $C_{12}H_8NH_2OH$. Mol. Wt., 185. M. P., 116-117°C. Soluble in alcohol. Soluble in hot benzene—almost insoluble cold. Extremely poor solubility in water. Chemical properties: typical of a simple amino phenol. Undergoes reactions on both the amino and hydroxy groups. Suggested uses, antioxidant, photographic developer, and dyestuff intermediate. Available in sample quantities. Monsanto Chemical Co.

2-AMINOTHIAZOLE

Empirical formula, $C_3H_4N_2S$. Mol. Wt., 100.14. Crystallizing pt., 87.5°C. Assay, 98%. Appearance, light brown crystals. Suggested uses, in chemical syntheses. Available in commercial quantities. Monsanto Chemical Co.

AMMONIUM BISACCHARATE

$COOH\cdot(CHOH)_4\cdot COONH_4$. Mol. Wt., 227. More soluble in cold water than the corresponding potassium salt. Freely soluble in hot water. Acidity, ml. n. NaOH/gm, 4.40. Odor, none. Color, white powder. Suggested use, for baking powders, effervescent salts, yeast food. Availability, in any quantities. Brocker Chemical Co.

AMMONIUM THIOSULFATE

$(NH_4)_2S_2O_3$. Mol. Wt., 148.20. White crystals 98-99% $(NH_4)_2S_2O_3$, 0.1% $(NH_4)S_2O_8$. Solubility, very soluble in water. Use, photographic developer. Availability, stock. The Edwal Laboratories, Inc.

AMMONIUM THIOSULFATE (60 Percent Solution)

Colorless to pale yellow solution. Contains 59-61% ammonium thiosulfate, 0.1-.2% ammonium sulfite. Use, photographic developer. Availability, stock. The Edwal Laboratories, Inc.

AMORPHOUS MINERAL WAX

Color in mass, black. Fracture, hackly. Lustre, dull to waxy. Streak, yellow to brown. Sp. Gr. at 77°F., 0.912. Fusing point (R & B Method), 180°F. M.P. (ASTM Pet. Method), 190°F. min. Congealing Point, 183°F. Ash, 0.16. Penetration at 77°F., 100 grms.—5 seconds, 10 max. Solubility in, Carbon disulfide, 99.5% min.; Carbon tetrachloride, 99.5% min.; Benzol, 99.870%; Mineral spirits, 99.770%; Turpentine, 99.570%. Insoluble in Ethyl and Methyl Alcohols. American Wax Sales Corp.

AMORPHOUS MINERAL WAX

Color in mass, amber. Structure, amorphous. Special feature, plasticity. Sp. Gr. at 77°F., 0.912. Refractive Index at 140°F., 1.4421. ASTM M. P., 192.5°F. Min. softening point (R & B) ASTM, 180°F. Acidity (mil. KOH per gram wax), 0.02. Ash, nil. Saponification No., 0.06. Iodine No., 9. Penetration at 77°F., 100 grms.—5 seconds, 14 max. Insoluble in Methyl and Ethyl Alcohols. Soluble in Benzol, Carbon Bisulfide, Mineral Spirits, Turpentine, and Carbon Tetrachloride. American Wax Sales Corp.

Di-tert-AMYLPHENOXY ETHYL ACETATE

$CH_3COO(CH_2)_2OC_6H_3(C_5H_{11})_2$. Mol. Wt., 320.5. Boiling Range, 332-341°C. Sp. Gr. at 20°/20°C., 0.980. Flash Point, 350°F. Color and form, light straw liquid. Odor, faint. Soluble in methyl alcohol, ethyl ether, acetone, benzene, gasoline, and ethyl acetate. Insoluble in water. Uses, may be of interest as a plasticizer or high boiling solvent. Availability, experimental quantities. Sharples Chemicals Inc.

P-tert-AMYLPHENOXY ETHYL ACETATE

$CH_3COO(CH_2)_2OC_6H_4C_5H_{11}$. Mol. Wt., 250.3. Boiling Range, 316-319°C. Sp. Gr. at 20°/20°C., 1.034. Flash Point, 340°F. Color and form, light straw liquid. Odor, faint. Soluble in methyl alcohol, ethyl ether, acetone, benzene, gasoline, and ethyl acetate. Insoluble in water. Uses, may be of interest as a plasticizer or high boiling solvent. Availability, experimental quantities. Sharples Chemicals Inc.

ANETHOL N. F., PURE

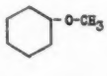
Sp. Gr. at 15.5/4°C., .9870. Ref. Ind. at 20°C., 1.5560. B. P., 233 to 234°C. M. P., 225°C. Anethol is derived from the isomeric phenol ether, methyl chavicol, which is a natural constituent of pine oil. The value of anethol is dependent on its licorice-like odor and taste, and, therefore, anethol finds its way into confectionery products and tobacco. Before it was commercially manufactured from pine oil, its principal source was the anise seeds of China. Upon oxidation it yields anise aldehyde, which is also used for its odor which closely resembles the hawthorn flower, and is known as "aubepine." Newport Industries, Inc.

ANHYDRO FORMALDEHYDE PARA TOLUIDINE

C_8H_9N. Mol. Wt., 119.15. White powder. M. P., 200°C. Sp. Gr., 1.3. Uses, in rubber compounding and as a dye intermediate. Heyden Chemical Corp.

ANISOLE

Mol. Wt., 108.06. Colorless liquid. Sp. Gr., $.9991^{5}/_{15}$. B. P., 155°C. Soluble in alcohol, ether. Insoluble in water. Used in syntheses and as an insecticide; also in perfumery. Organic Products Co.



APASOL

Sulfonated ester. Jacques Wolf and Company.

ARISTOWAX

Fully refined, white paraffin wax. M. P., 145°F. AMP. and 160/165°F. AMP. Penetration at 77°F., about 15. Union Oil Company of California. Distributors: Petroleum Specialties, Inc.

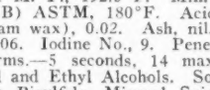
"AVITONE" A

A saturated hydrocarbon sulfonate. Principal use, textile finishing agent. E. I. du Pont de Nemours & Company (Inc.).

BARIUM METAPHOSPHATE

BaP_2O_6. Mol. Wt., 295.40. Appearance, white crystalline powder. M. P., red heat (about) 850°C. Insoluble in water. Suggested uses, opacifying agent in glazes. Constituent in special types of glass. Available for experimental investigation. Monsanto Chemical Co.

BARIUM SACCHARATE



Mol. Wt., 381.36. Insoluble in water. Odor, none. Color, slightly yellowish. Suggested use, for pyrotechnics, burns with green light. Poisonous, kills rodents. Availability, in commercial quantities. Brocker Chemical Co.

BEESWAX SUBSTITUTE #662

M. P., 143-149°F. Acid No., 16-22. Ester No., 70-74. Sp. Gr., .940. Sap. No., 86-96. Isco Beeswax Substitute #662 can be used to advantage replacing beeswax where the U.S.P. grade is not required. Innis, Speiden & Co.

BENZALAZINE (Dibenzal Hydrazine)

Empirical formula, $C_{14}H_{12}N_2$. Mol. Wt., 208.25. M. P., 93°C. Solubility in water, practically insoluble. Uses, preparation of stilbene, other organic syntheses. Availability, stock. The Edwal Laboratories, Inc.

BENZALDEHYDE SEMICARBAZONE

Empirical formula, $C_8H_9ON_3$. Mol. Wt., 163.18. M. P., 222°C. Solubility, practically insoluble in water. Availability, stock. The Edwal Laboratories, Inc.

BENZYLTRIMETHYLAMMONIUM HYDROXIDE

$C_6H_5CH_2N(CH_3)_3OH$. Properties of 42% solution. Sp. Gr. 20°/20°C., 1.07; pH (0.1 M Solution), 12.3; Refractive Index, 20°C. 1.444; F. P., °C. less than —10; B. P., °C. 112 decomposed. Benzyltrimethylammonium Hydroxide is one of the most powerful organic bases known. It is highly dissociated in water and readily forms salts with both inorganic and organic acids. Its aqueous solutions dissolve cellulose, suggesting numerous applications in textile industries. Benzyltrimethylammonium Hydroxide is stable up to 50°C.—but decomposes at higher temperatures into benzyl alcohol and trimethylamine. Thus it has special value as an alkaline catalyst, since it can easily be decomposed and removed after it has served its purpose. Available in a 42% solution. Commercial Solvents Corp.

BENZENE SULFONAMIDE

Empirical formula, $C_6H_5SO_2NH_2$. Mol. Wt., 157. Crystallizing pt., 152°C. min. Appear., fine crystalline material. Suggested uses, intermediate in chemical synthesis; plasticizer. Available only in small quantities for experimental investigation. Monsanto Chemical Co.

BENZENE SULFONCHLORIDE

Empirical formula, $C_6H_5O_2SCl$. Crystallizing pt., 15.4°C. Assay, 99.0%. Appearance, colorless liquid. Suggested uses, primarily in chemical syntheses. Available only in small quantities for experimental investigation. Monsanto Chemical Co.

For your convenience in asking for more detailed information on

BENZOTHIAZOLE

Empirical formula, C_7H_5NS. Mol. Wt., 126. Refractive index, n^{25}/D 1.636. Sp. Gr., 1.23 @ 20°/4°C. Boiling pt., 230°/750 mm. Appearance, white on distillation, gradually darkens in light. Odor, disagreeable Chemical reactions: reacts with sulfur to form 2-mercaptobenzo thiazole; hydrolyzed by caustic fusion to give 2-amino-thiophenol. Suggested uses, plasticizer, rubber softener, dyestuff intermediate. Available in sample quantities only. Monsanto Chemical Co.

BENZYLTRIMETHYLAMMONIUM CHLORIDE

$C_6H_5CH_2N(CH_3)_3Cl$. Properties of 60% aqueous solution. Sp. Gr. 20°C/20°C, 1.07; pH (0.1 M solution), 7.4. Refractive Index, 20°C, 1.472. F. P., °C, less than —50; B. P., °C, decomposes. A neutral salt, highly soluble in water. The anhydrous material is stable up to about 200°C., but with further heating it decomposes to form benzyl chloride and trimethylamine. Offered in a 60% solution. Commercial Solvents Corp.

6, 6′ BIS-(2, 2, 4 TRIMETHYL-1, 2 DIHYDROQUINOLINE)

M. P., 145-150°C. Soluble in benzol, toluene and acetone; slightly soluble in alcohol. Insoluble in water. Appearance, a buff powder. Suggested use, antioxidant for low-sulfur-content rubber articles. Available in sample quantities only. Monsanto Chemical Co.

BISMUTH SODIUM IODIDE (Sodium Iodo Bismuthite, Sodium Bismuth Iodide)

A double salt of bismuth and sodium iodides. Approx. $2NaI.BiI_3$ with about 11% water of hydration ($6H_2O$). Mol. Wt., approx. 933. Bismuth, 20.3-21.8%; Iodine, 60-63%. water, 10.5-12.5%. Red crystals. Solubility, hydrolysis in more than 1 part water, soluble in absolute alcohol, glycerine, ethyl acetate, ethylene glycol. Insoluble in ether, chloroform and carbon disulfide. Use, medicinal. Availability, made up to order. The Edwal Laboratories, Inc.

BLOOD ALBUMEN

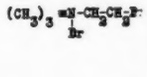
Spray dried beef blood serum. Water soluble. Coagulatable with heat at 160°F. Uses, textile sizing, leather finishing, affixing cork discs to inside of bottle crowns and paper coating. Standard containers, veneer drums holding 200 lbs. net. Armour and Company.

BORON, AMORPHOUS

Symbol B. Atomic Wt., 10.82. Sp. Gr., 2.45. M. P., 2000-2500°C. B. P., Sublimes at 2550°C. Non-metallic—similar to carbon. Forms borides with many metals and non-metals. Uses, production of pure borides—manufacture of abrasives. King Laboratories Inc.

BROMO CHOLINE BROMIDE

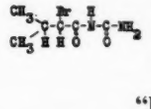
Mol. Wt., 246.82. White, odorless crystals. M. P., 230-231°C. Soluble ether, alcohol, water, and most organic solvents. Uses, in pharmacy as a vaso-dilator. Organic Products Co.



BROMURAL

(alpha Mono Bromo-Isovaleryl-Urea)

Mol. Wt., 223.02. White powder. M. P., 147-149°C. Slightly soluble in cold water, freely soluble in alcohol, ether, hot water. Used in pharmacy as a sedative. Organic Products Co.



"BUBBLFIL"

In this new product small bubbles of air are trapped and sealed at spaced intervals in strands of regenerated cellulose made by the viscose process. The resulting product is resilient and has a buoyancy about equal to that of imported kapok. The low thermal conductivity indicates possible use as an insulating material. Other suggested uses, buoyant substitute for kapok and sponge rubber in products such as life jackets, life boats and rafts, and other military applications. Tightly packed "Bubblfil" weighs about 1.5 pounds per cubic foot and will support 20 to 30 times its weight of lead. The bubbles cannot be broken by squeezing, nor will they rupture at the extremely low pressures of high altitudes. The material also is quite stable to extremes in temperature. On prolonged immersion in water it loses buoyance less rapidly than kapok. The "springiness" of the entrapped air suggests suitability as a shock-absorbing material, substituting for sponge rubber or so-called "cellular rubber." The size and spacing of the bubbles, which are streamlined in shape, may be arranged according to choice. Much of the bubble-strand now being made has bubbles a little more than a quarter of an inch long, running three to the inch. A smaller size is also made. Available in limited amounts for war uses only. E. I. du Pont de Nemours & Company, (Inc.).

BUTADIENE

$CH_2=CHCH=CH_2$. Mol. Wt., 54.09. Colorless, easily liquefied gas. Boils at —4.51°C. at 757 mm. and freezes at —108.9°C. The specific gravity of the liquid at 60/60°F. is 0.6272, and the average weight at this temperature is 5.22 pounds per gallon. Possesses very strong additive tendencies, uniting with many reagents known to add to the double bond, such as halogens and halogen acids. Uses, an essential raw material in the manufacture of various types of synthetic rubber. When conjointly polymerized with acrylonitrile or styrene, it yields rubber-like products which possess most of the qualities of natural rubber and are superior from the standpoint of resisting heat, abrasion, gasoline and other swelling agents. Carbide and Carbon Chemicals Corporation.

BUTYL ACETATE SILICA SOL

Analysis: SiO_2, 13.5% and butyl acetate, 86.5%. Sp. Gr., 0.96 @ 25°C. Laboratory samples available Monsanto Chemical Co.

n-n-BUTYL BENZENE SULFONAMIDE

Empirical formula, $C_6H_5SO_2NHC_4H_9$. M.W., 213. Sp. Gr., 1.1464 @ 25°C. Refractive Index, 1.522 @ 25°C. Appearance, clear liquid, Suggested uses, plasticizer for cellulose acetate, cellulose nitrate and ethyl cellulose. Available only in small quantities for experimental investigation. Monsanto Chemical Co.

BUTYL "CELLOSOLVE" ACETATE

$C_4H_9OCH_2CH_2OOCCH_3$. Specific gravity at 20/20°C., 0.940. B. P., 191.5°C. Refractive Index, 1.4160. Solubility in water at 20°C., 1.1%. Colorless, stable liquid with a pleasant ester-like odor. Uses, because it possesses high solvent powers for nitrocellulose, cellulose esters, and synthetic resins, it may be used in special surface coatings, printing inks, and varnish removers. Available only in research quantities. Carbide and Carbon Chemicals Corp.

BUTYL CHLORIDE

$CH_3CH_2CH_2CH_2Cl$. Mol. Wt., 92.57. Sp. Gr., 0.8875 at 20/20°C. B. P., 78.6°C. (760 mm.). Solubility in water, 0.11%. Low boiling, water-white liquid with an ethereal odor. Uses, good solvent for oils, fats, waxes, and greases. It is an economical and convenient alkylating agent for introducing the normal butyl group in the production of butyl cellulose, butyl-substituted amines and hydrocarbons, and other derivatives. Carbide and Carbon Chemicals Corporation.

2, 3 BUTYLENE GLYCOL

$CH_3CHOHCHOHCH_3$. Mol. Wt., 90.12. B. P., 183-4°C. A colorless liquid, soluble in water in all proportions, of possible use as an intermediate in the plastics industry as well as in general synthetic work. Heyden Chemical Corp.

CALCIUM MAGNESIUM PYROPHOSPHATE

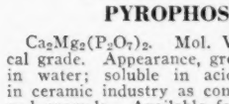
$Ca_2Mg_2(P_2O_7)_2$. Mol. Wt., 476.88. Technical grade. Appearance, grey powder. Insoluble in water; soluble in acids. Suggested uses, in ceramic industry as constituent of porcelains and enamels. Available for experimental investigations. Monsanto Chemical Co.

CALCIUM NITRATE

Empirical formula, $Ca(NO_3)_2.3H_2O$. Assay, 98.95%. This chemical has possible use as a coagulant in latex dipping processes. Available in commercial quantities. Monsanto Chemical Co.

CALCIUM PANTOTHENATE (Dextrorotary)

Mol. Wt., 476.0. Calcium Content, 8.41. M. P., 185-187° C. Optical Rotation, $(D_{25}) = +25.7 \pm 0.5°$ (in water, C = 2%, l = 2 dcm.). Biochemical Activity, tested with *Lactobacillus casei E.* is 100% for pure d-salt. For treatment of deficiency diseases as part of Vitamin B complex. A clean white odorless crystalline powder. Extremely hygroscopic and deliquescent. An aqueous solution is neutral or slightly alkaline to litmus. Soluble in alcohol, insoluble in dry ether or benzene. American Cyanamid Co.

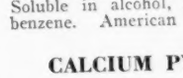


CALCIUM PYROPHOSPHATE

$Ca_2P_2O_7$. Mol. Wt., 254.20. Appearance, white non-gritty powder. Odor, none. Taste, none. M. P., 1230°C. Density, 36-37 lbs. per cu. ft. Insoluble in water; soluble in acids. Suggested uses, source of calcium and phosphorus in mineral enrichment of foods. Commercially available in 100-lb. kegs and 200-lb. barrels. Monsanto Chemical Co.

CALCIUM SACCHARATE

Mol. Wt., 284. Solubility, 0.015 gm/100 ml water of 26°C., far more soluble when freshly prepared and the molecule contains 6 crystals water instead of 2. Odor, none. Color, white. Suggested use, stabilizer for calcium gluconate solutions; for improvement of teeth and in caries; in bone fractures; as a cheap calcium carrier. Availability, in any quantities. Brocker Chemical Co.



CARNAUBA WAX SUBSTITUTE #580

M. P., 181½-183°F. Isco Carnauba Wax Substitute #580 is being used in many industries replacing Carnauba Wax. Innis, Speiden & Co.

CETYL BROMIDE

Empirical formula, $C_{16}H_{33}Br$. Mol. Wt., 305.35. Sp. Gr., 0.9970 at 20°C. Solubility, insoluble in water, soluble in organic solvents. Yellowish liquid. Uses, preparation of anionic surface active agents, pharmaceutical intermediate. Availability, stock. The Edwal Laboratories, Inc.

CETYL LEVULINATE (S567)

Empirical formula, $C_{21}H_{40}O_3$. Mol. Wt., 340.5. Consistency, soft, crystalline, waxy solid. Color, yellowish. M. P., 47°C. Soluble in ethanol, ethyl acetate, toluene, naphtha. Insoluble in water. Suggested uses, textile finishing, wax polishes. Glyco Products Co., Inc.

CHLORAMINE-B (Sodium N-Chlorobenzenesulfonamide)

Empirical formula, $C_6H_5SO_2NClNa.1\frac{1}{2}H_2O$. Mol. Wt., 240.6. White, crystalline solid in form of small, flat glistening plates. Contains 29+% available chlorine. Solubility in water;

any of these products we suggest the use of coupon on page 573.

Chloramine B (Cont'd)

20.0% at 20°C. Slightly chlorous odor. Noticeable taste above 50 P.P.M. Good stability, low toxicity, high germicidal activity. Suggested uses, sanitation in hospitals, public buildings, dairies, hotels, restaurants and in the home. Pharmaceutical preparations. Textiles. Available in limited quantities for experimental work. The Solvay Process Co.

CHLOROACETONE

CH_2COCH_2Cl. Chloroacetone contains an active ketone group and an extremely reactive chlorine atom. It should therefore find wide application in the synthesis of many products such as pharmaceuticals, dyes, and other organic compounds. For example, Chloroacetone reacts readily with amines to form acetonyl-amines, with glycols to form chlorodioxolanes, with mercaptans to form sulfides or sulfur ethers, and with potassium formate to form acetol. Heretofore, Chloroacetone has not been available to the chemical industry because of its marked tendency to decompose on storage. C. S. C. Chloroacetone is stabilized so that it can be stored for many months without decomposition or chemical change. Its purity is 85% to 90%, the remainder consisting almost entirely of unsymmetrical dichloroacetone. Chloroacetone is a very powerful lachrymator and will blister the skin on contact. Adequate precautions should therefore be taken in handing this product. Properties: Boiling Point, 119°C. at 760 MM. of mercury (pure material). Flash Point, 42.2°C. (108°F.). Sp. Gr., 1.165 at 20°C./20°C. Weight per U. S. Gallon, 9.69 lbs. at 68°F. Refractive Index, 1.4324 at 20°C. Coefficient of Cubical Expansion, 0.00110 per °C., 0.00061 per °F. Odor, Strong, irritating (lachrymatory). Commercial Solvents Corp.

Alpha CHLOROCROTONAMIDE

$CH_3.CH = CCl.CONH_2$. Mol. Wt., 119.5. M. P., 111-114°C. Soluble in organic solvents and water. It is a typical amide and is hydrolyzed by both acid and base catalysis. Suggested uses, intermediate. Pennsylvania Salt Mfg. Co.

1-CHLORO-1-NITROETHANE

CH_3CHNO_2Cl. Mol. Wt., 109.52. Sp. Gr. at 20°C./20°C., 1.258. Pounds per U. S. Gallon at 20°C., 10.47. Boiling Range, °C. (90%); 122.0-128.5. Flash Point, °F.: 133. Refractive Index at 20°C., 1.423. Solubility (cc. per 100 cc. at 20°C.), solvent in water, less than 0.4; water in solvent less than 0.5. The presence of a chlorine atom and a nitro group on the same carbon atom is responsible for the chemical reactivity of the chloronitroparaffins and for the unusually interesting nature of the products which can be derived from them. They are stable liquids miscible with most organic solvents including the lower alcohols, glycols, esters, ethers, petroleum hydrocarbons, mineral oils, and vegetable oils. They are also good solvents for fats and waxes. One interesting application of these compounds is as anti-gelling agents in certain types of rubber cement. Commercial Solvents Corp.

1-CHLORO-1-NITROPROPANE

$CH_3CH_2CHNO_2Cl$. Mol. Wt., 123.54. Sp. Gr., 1.209. Pounds per U. S. Gallon at 20°C., 10.06. Boiling Range °C. (90%); 139.5-143.3. Flash Point, °F.; 144. Refractive Index at 20°C., 1.430. Solubility (cc. per 100 cc. at 20°C.), solvent in water, less than 0.8; water in solvent less than 0.4. The presence of a chlorine atom and a nitro group on the same carbon atom is responsible for the chemical reactivity of these compounds and for the unusually interesting nature of the products which can be derived from them. They are stable liquids miscible with most organic solvents including the lower alcohols, glycols, esters, ethers, petroleum hydrocarbons, mineral oils, and vegetable oils. They are also good solvents for fats and waxes. One interesting application of these compounds is as anti-gelling agents in certain types of rubber cement. Commercial Solvents Corp.

2-CHLORO-2-NITROPROPANE

$CH_3CNO_2ClCH_3$. Mol. Wt., 123.54. Sp. Gr., at 20°C./20°C., 1.193. Pounds per U. S. Gallon at 20°C., 9.93. Boiling Range, °C. (90%); 129.0-132.3. Flash Point, °F., 135. Refractive Index at 20°C., 1.425. Solubility (cc. per 100 cc. at 20°C.), solvent in water, less than 0.5; water in solvent less than 0.5. The presence of a chlorine atom and a nitro group on the same carbon atom is responsible for the chemical reactivity of the chloronitroparaffins and for the unusually interesting nature of the products which can be derived from them. They are stable liquids miscible with most organic solvents including the lower alcohols, glycols, esters, ethers, petroleum hydrocarbons, mineral oils, and vegetable oils. They are also good solvents for fats and waxes. One interesting application of these compounds is as anti-gelling agents in certain types of rubber cement. Commercial Solvents Corp.

2-CHLOROPROPENE

Empirical formula, C_3H_5Cl. Mol. Wt., 76.53. B. P., °C. (760 mm.), 23. Density, 20/4°C., 0.918. Flash-point, °F., below 0. Solubility in water, % at 20°C., 0.2. A volatile colorless liquid. This is an unsaturated chloride of the relatively stable vinyl type; since halogens can be made to add or subtsitute according to conditions, however, it has interesting possibilities as an intermediate. The compound is available in experimental quantities and in small commercial quantities. Produced by Shell Development Co., Selling Agent, R. W. Greeff & Co., Inc.

CHROMYL CHLORIDE

CrO_2Cl_2. Mol. Wt., 155. Dark red fuming mobile liquid resembling bromine in appearance. Sp. Gr., 1.96. Boiling Point, 116.7°C. Freezing Point, —96.5°C. Odor, powerful, pungent. Soluble in carbon tetrachloride, carbon bisulfide, acetic acid, nitrobenzene, stannic bromide, ethylene dibromide, chloroform; decomposed by water and many organic solvents. Chemical Reactivity, Fairly stable to heat; reacts slowly with water, violently with many organic substances; reactions must be controlled by dilution with above relatively inert solvents. Suggested uses, as an organic-soluble oxidizing agent; in the preparation of organic chromium derivatives; as a fumigant; metal surface treatment for improved corrosion resistance and adhesion to organic materials, modifying surface characteristics of paper and textile products by vapor-phase treatment. This material is available in small quantities for experimental investigation. E. I. du Pont de Nemours & Company, (Inc.).

COATING 54-18 B

Acrylic type resin solution. May be diluted with aromatic or alifatic solvents. Principal use is coating for metals where strength and electrical resistance are required. Good adhesion to oxidized surfaces. American Resinous Chemicals Corporation.

COPPER A COMPOUND (An inorganic copper containing fungicide)

A finely divided water insoluble basic salt of copper containing not less than 45% of copper expressed as metallic copper. Uses, for the control of fungus diseases on a number of important agricultural crops such as celery, sour cherries, tomatoes, potatoes, cucurbits and sugar beets. E. I. du Pont de Nemours & Co., (Inc.).

COSMETOL N

Water soluble, alkalol amine salt of high foam. Water white clear viscous liquid, with faint pleasant odor. 1% solution has a pH of 5.45 and a surface tension of 36 dynes/cm. Wetting time of 0.1% active ingredient is 30 seconds (Draves Test). Uses, soapless shampoo, wetting and cutting agent in brushless shaving creams, detergent and bubble bath base, penetrating and lathering agent. Toxicity, pharmacological tests show Cosmetol N to be less irritating than soap. U.S. Patents #2,189,803, 2,184,770 and 2,236,541; also Patents Pending. The Emulsol Corp.

CRYSTOX

(C_{18} Unsaturated Ketol)

Empirical formula, $C_{18}H_{36}O_2$. Mol. Wt., 276. B. P., °C. (2-3 mm.), 150. M. P. °C.; 84. Crystox is a white, odorless, crystalline material when pure. Commercial material may contain about 2% of light hydrocarbons which does not reduce its effectiveness and which facilitates somewhat the makeup of solutions in kerosene for spray purposes. Uses, insecticide, particularly effective as a partial replacement for pyrethrum in fly-spray. Produced by Shell Development Co., selling agent, R. W. Greeff & Co., Inc.

COUMENE 51-7

Coumarone-indene type resin emulsion. Properties are in general similar to those of ester gum but product has more compatibility in blending with other types of resins. Used principally as latex extender. American Resinous Chemicals Corporation.

CYCLOHEXYL LEVULINATE (S577)

Empirical formula, $C_{11}H_{18}O_3$. Mol. Wt., 198.2. Consistency, liquid. Color, orange-red. Soluble in ethanol, acetone, ethyl acetate, toluene, naphtha. Insoluble in water. Suggested uses, plasticizer, solvent. Glyco Products Co, Inc.

CYCLOHEXYLPENTACHLORO-PHENYL ETHER

Empirical formula, $C_6Cl_5OC_6H_{10}$. Mol. Wt., 347.5. M.P., 75-78°C. Soluble in organic solvents, insoluble in water. It is inert toward alkali but is readily split by cold, concentrated sulfuric acid. Suggested uses, as a plasticizer and intermediate. Pennsylvania Salt Mfg Co.

Para CYMENE

Sp. Gr. at 15.5/4°C., .8612. Ref. Ind. at 20°C., 1.4895. Boiling Range, 177-178°C. Para cymene has been heretofore obtained in crude form in small amounts, as it is a natural constituent of "spruce turpentine". Para cymene of high purity in larger quantities is now obtained from terpene hydrocarbons by new processes. Excellent solvent properties of this hydrocarbon make it a valuable component of lacquers and varnishes and other compositions where the proper adjustment of evaporation rate is desired. As a benzene derivative it is easily nitrated and sulfonated. The nitrocymene yields cymidine on reduction, a starting point for an interesting series of dyes and other synthetics. Newport Industries, Inc.

DEODOL

Acid stabilized higher fatty acid esters, Cream colored, waxy hard solid with a faint odor. Disperses in water easily. A 1% dispersion has a pH of 3.8 and a surface tension of 34.2 dynes/cm. Acidity expressed as hydrochloric acid 2.7%; specific gravity 0.98; titre 51° to 52°C. (Contains no soap.) Uses, acid emulsifier for cosmetic and pharmaceutical creams. Especially useful for the preparation of stable aluminum chloride creams for antiperspiration purposes. Toxicity, pharmacological tests have shown this material to be non-irritating and having excellent emolient properties. U.S. Patent Pending. The Emulsol Corp.

DIACETYL

$CH_3COCOCH_3$. Mol. Wt., 86.09. B. P., 87-8°C. Water solubility at 15°C., 20%. A yellow liquid of characteristic odor. This 1, 2 diketone is of use as an intermediate in synthetic organic chemistry. Heyden Chemical Corp.

DIACETYLAMINOAZOTOLUOL

(Dimazon, Pellidol)

Empirical formula, $C_{18}H_{19}N_3O_2$. Mol. Wt.,

For your convenience in asking for more detailed information on

Diacetylaminoazotoluol (Cont'd)

309.17. M. P., 72-75°C. Orange red powder. Use, medicinal. Availability, stock. The Edwal Laboratories, Inc.

DIAZO SULFATE OF p-AMINODIPHENYLAMINE

Solubility, soluble in water. Yellow crystals quantitatively decomposed by light. Availability, stock. The Edwal Laboratories, Inc.

DIBUTOXYMETHANE

$CH_2(OC_4H_9)_2$. Mol. Wt., 160.25. Sp. Gr., 0.838 at 20°/20°C. Distillation Range, 164°C. to 186°C. M. P., °C ., —59.9. Flash Point, °C., 60. Under slightly acid conditions, Dibutoxymethane in aqueous solutions slowly decomposes with the formation of formaldehyde. This product should therefore be useful in the manufacture of synthetic resins, antiseptics, deodorants, and fungicides. Commercial Solvents Corp.

DIBUTYL PHTHALATE

Dibutyl ester of Phthalic Acid. Sp. Gr., @ 25°C., 1.050. Refractive Index @ 25°C., 1.490. B. P. at 760 mm., 325°C. Color, prime white to water white. M. P., below —35°C. Miscible with coal-tar hydrocarbons, ketones, esters, and alcohols. Uses, plasticizer in smokeless powder, lacquers, adhesives, coatings, and impregnants. Chemical intermediate. Lubricant. The Neville Co.

DIBUTYL SEBACATE

$[(CH_2)_4COOC_4H_9]_2$. Mol. Wt., 314.45. Odor, none. Distillation Range, 175°C. to 180°C. at 3 mm. of mercury. M. P., °C., —8. Flash Point. °C., 180. Refractive Index. 20°C., 1.4423. Dibutyl Sebacate is an excellent plasticizer for polyvinyl acetal for use in safety glass. It is also recommended as a plasticizer for nitrocellulose and other cellulose derivatives as well as for acrylic, vinyl and phenolic resins and for chlorinated rubber. It has also been suggested as a dielectric, heat transfer agent, anti-foam agent, and as a perfume fixative. Commercial Solvents Corp.

DICHLORETHYL FORMAL

$CH_2(OCH_2CH_2Cl)_2$. Mol. Wt., 173.04. Sp. Gr., 1.2339 at 20/20°C. Boiling Point, 218.1°C. (760 mm.). Colorless, high-boiling liquid which is 0.78 per cent soluble in water at room temperature. Its chemical properties are very similar to those of dichlorethyl ether and triglycol dichloride. Uses, an intermediate in the manufacture of synthetic rubber which is characterized by low hydrocarbon solubility and flexibility at low temperatures. The reactive terminal chlorine atoms of the formal suggest other uses as a chemical intermediate. It can be made to liberate formaldehyde and ethylene chlorhydrin by suitable treatment; hence it may be used to advantage where a gradual development of these products is desired. Its water solutions show promise as soil fumigants. Carbide and Carbon Chemicals Corporation.

1, 1-DICHLORO-1-NITROETHANE

$CH_3CNO_2Cl_2$. Mol. Wt., 143.97. Sp. Gr. at 20°C./20°C., 1.405. Pounds per U. S. Gallon at 20°C., 11.69. Boiling Range, °C. (90%); 122.0-125.0. Flash Point, °F.; 168. Refractive Index at 20°C., 1.441. Solubility (cc. per 100 cc. at 20°C.), solvent in water, less than 0.5, water in solvent, 0.5. The presence of a chlorine atom and a nitro group on the same carbon atom is responsible for the chemical reactivity of the chloronitroparaffins and for the unusually interesting nature of the products which can be derived from them. They are stable liquids miscible with most organic solvents including the lower alcohols, glycols, esters, ethers, petroleum hydrocarbons, mineral oils, and vegetable oils. They are also good solvents for fats and waxes. One interesting application of these compounds is as anti-gelling agents in certain types of rubber cement. Commercial Solvents Corp.

1, 1-DICHLORO-1-NITROPROPANE

$CH_3CH_2CNO_2Cl_2$. Mol. Wt., 157.99. Sp. Gr. at 20°C./20°C., 1.314. Pounds per U. S. Gallon at 20°C., 10.93. Boiling Range °C. (90%); 141.0-143.6. Flash Point, °F.; 151. Refractive Index at 20°C., 1.443. Solubility (cc. per 100 cc. at 20°C.), solvent in water, less than 0.5; water in solvent, less than 0.5. The presence of a chlorine atom and a nitro group on the same carbon atom is responsible for the chemical reactivity of the chloronitroparaffins and for the unusually interesting nature of the products which can be derived from them. They are stable liquids miscible with most organic solvents including the lower alcohols, glycols, esters, ethers, petroleum hydrocarbons, mineral oils, and vegetable oils. They are also good solvents for fats and waxes. One interesting application of these compounds is as anti-gelling agents in certain types of rubber cement. Commercial Solvents Corp.

DIETHYLENE GLYCOL DILEVULINATE (S454)

Empirical formula, $C_{14}H_{22}O_7$. Mol. Wt., 270.4. Consistency, liquid. Color, amber. Sp. Gr., 1.145 @ 25°C. Volatility at 105°, negligible. Soluble in water, ethanol, toluene. Insoluble in petroleum hydrocarbons. Compatible with nitrocellulose, cellulose acetate, vinyl resins. Suggested uses, plasticizer. Glyco Products Co., Inc.

DIETHYLENE GLYCOL HEXARICINOLEATE (S554)

Empirical formula, $C_{112}H_{202}O_{15}$. Mol. Wt., 1788.9. Consistency, liquid. Color, amber. Soluble in acetone, ethyl acetate, toluene, naphtha, ethyl butanol. Insoluble in ethanol, isopropanol, water. Suggested uses, emulsifying agent for water in oil emulsions, lubricants, hydraulic fluids. Glyco Products Co., Inc.

DIETHYLENE GLYCOL MONOETHYL ETHER LEVULINATE (S625)

Empirical formula, $C_{11}H_{20}O_5$. Mol. Wt., 232.2. Consistency, liquid. Color, orange-red. Soluble in water, ethanol acetone, ethyl acetate, toluene. Insoluble in naphtha, oils. Suggested uses, solvent, plasticizer. Glyco Products Co., Inc.

DIETHYLENE GLYCOL MONOETHYL ETHER OLEATE (S290)

Empirical formula, $C_{24}H_{46}O_4$. Mol. Wt., 398.6. Consistency, liquid. Color, yellow. Soluble in alcohol, acetone, ethyl acetate, toluene, naphtha. Insoluble in water. Suggested uses, plasticizer, lubricant. Glyco Products Co., Inc.

DIGLYCOL DIACETATE

$(CH_3COOCH_2CH_2)_2O$. Mol. Wt., 190.19. Sp. Gr., at 20/20°C., 1.1159. Boiling Point, 250°C. (760 mm.). Solubility in water, complete. Water-white liquid. Uses, relatively high-boiling, slow-evaporating solvent for cellulose ester, printing inks and lacquers. It is an excellent solvent for cellulose acetate and is used for preventing blushing in airplane dopes. It can be used as a perfume fixative and as a non-discoloring plasticizer for ethyl and benzyl cellulose. Available only in research quantities. Carbide and Carbon Chemicals Corporation.

DIGLYCOL OLEO-RICINOLEATE (S506)

Empirical formula, $C_{40}H_{74}O_5$. Mol. Wt., 634. Consistency, oil. Color, yellow. pH (5% solution), 8.3. Miscible with alcohol, ethyl acetate, toluene, naphtha, mineral oil, and vegetable oil. Compatible with methanol and acetone. Suggested uses, emulsifying agent, metal drawing and stamping lubricant, ingredient for the manufacture of textile finishing oils and lubricant for rayons, etc., anti-foaming agent for casing, dry cleaning soap base, dye and color solvent. Glyco Products Co., Inc.

DIISOPROPANOLAMINE

$(CH_3CHOHCH_2)_2NH$. Mol. Wt., 133.13. Sp. Gr. at 20/20°C., 1.0089. Boiling Point, 116°C. (5 mm.). Solubility in water, complete. Moderately viscous liquid. Uses, in the manufacture of pharmaceuticals, emulsifying agents for polishes, textile specialties, leather compounds, insecticides, cutting oils and water paints. Available only in research quantities. Carbide and Carbon Chemicals Corporation.

DiIsopropanolamine (Cont'd)

2, 3-DIMETHOXY BENZALDEHYDE, (Technical)

Empirical formula, $C_9H_{10}O_3$. Mol. Wt., 166.0. Sp. Gr. at 60°C., 1.117. Wt. per gal., 9.3 lbs. Crystallizing pt., 47.5°C. min. Almost completely soluble in sodium bisulfite. Appearance, yellowish brown fused crystalline mass. Suggested uses, intermediate in chemical synthesis and perfume fixative. Available in commercial quantities. Monsanto Chemical Co.

DIMETHYLAMINOETHANOL

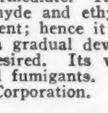
$(CH_3)_2NCH_2CH_2OH$. Mol. Wt., 89.1. M. P., —70°C. Boiling Range, 131-135°C. Sp. Gr. @ 20/20°C., 0.887. Refractive Index @ 20°C., 1.430. Viscosity at 25°C., 3.4 centipoise. Flash Point, 120°F. Color and form, water white liquid. Odor, amine. Soluble in water, methyl alcohol, ethyl ether, acetone, benzene, gasoline, and ethyl acetate. Uses, suggested for use as a raw material or intermediate in the synthesis of dyestuffs, pharmaceuticals and textile assistants. Availability, experimental quantities. Sharples Chemicals, Inc.

DIMETHYLETHANOLAMINE (Dimethylaminoethanol)

$(CH_3)_2NCH_2CH_2OH$. Mol. Wt., 89.14. Boiling Point, 133°C. Sp. Gr. at 20/20°C., 0.887. Equivalent weight, 89. Refractive Index, 1.4300. Solubility in water, complete. Colorless, amine-odored liquid which is miscible with water and benzene. Its properties are similar to those of diethylethanolamine (diethylaminoethanol) which has been used commercially for many years. Uses, in the synthesis of dyestuffs, textile auxiliaries, pharmaceuticals, and corrosion inhibitors. Carbide and Carbon Chemicals Corporation.

DIMETHYL DIOXANE

Mol. Wt., 116.16. Sp. Gr. at 20/20°C., 0.9268. B. P., 117.5°C. (760 mm.). Solubility in water, 4.33%. Water-white liquid. Uses, general extractant and solvent for dyestuffs, oils, fats, waxes, and cellulose derivatives. Available only in research quantities. Carbide and Carbon Chemicals Corporation.



DIMETHYL HYDANTOIN

A white, odorless solid (M. P., 178°C.) which crystallizes in the form of prisms or needles from water, alcohol or diethyl ether and deposits as needles when sublimed. It is readily soluble in water, alcohol, diethyl ether and ethyl acetate. Its properties indicate that it may be useful as a raw material for water-soluble, hard, glass-like resins and viscous, liquid resins which may have value in applications to textiles, paper, leather, etc. and for modifying the properties of other water-soluble materials. Available in small quantities for experimental investigation. E. I. du Pont de Nemours & Company (Inc.).

DI-(2-METHYL-5-ISOPROPYL PHENOL) SULFIDE

M. P., 162-167°C. Soluble in dilute sodium hydroxide, slightly soluble in carbon tetrachloride. Appearance, white powder. Suggested use, antioxidant for white rubber goods. Available in sample quantities only. Monsanto Chemical Co.

DIETHYL STEARAMIDE

$C_{17}H_{35}CON(C_2H_5)_2$. Mol. Wt., 339.4. M. P., 16-18°C. Boiling Range, 190-205°C. @ 1 mm.

any of these products we suggest the use of coupon on page 573.

Diethyl Stearamide (Cont'd)

Sp. Gr. @ 20°C., 0.866. Refractive Index @ 20°C., 1.4597. Viscosity @ 25°C., 20.6 centistokes. Flash Point, 375°F. Color and form, light straw colored liquid. Odor, faintly fatty acid. Very soluble in methyl alcohol, ethyl ether, acetone, benzene, naphtha, and ethyl acetate. Insoluble in water. Uses, suggested as a plasticizer for the oil-resistant types of synthetic rubbers. Also as a plasticizer for certain types of synthetic resins. Availability, experimental quantities. Sharples Chemicals Inc.

DIMETHYL TOLYL CARBINOL (Technical)

Sp. Gr. at 15.5/4°C., .9823. Refractive Index at 20°C., 1.5200. Boils at about 100°C. at 7 mm. pressure. It is unstable on distillation at atmospheric pressure. Dimethyl tolyl carbinol is derived chemically from para cymene. This tertiary alcohol can be catalytically dehydrated to alpha-methyl para-methyl styrene. The carbinol has solvent and wetting properties similar to pine oil. The odor, however, resembles that of sweet clover. It is a mild disinfectant. This product is only available as a technical quality, containing from 75 to 85% tertiary alcohol. It always contains 15 or more percent of methyl acetophenone, from which it cannot be separated by distillation. Newport Industries, Inc.

o-DIPHENYL BIGUANIDE

Empirical formula, $C_{14}H_{15}N_5$. Mol. Wt., 273. Melting Pt., above 150°C. pH of 0.1% water-solution, 8.0. Solubility in water, 0.1% @ 25°C., in alcohol, 10% @ 25°C., in acetone, 5%. Appearance, pinkish white. Suggested uses, as an antioxidant in soap and oils. Available in sample quantities only. Monsanto Chemical Co.

DISODIUM METHYL ARSONATE

Mol. Wt., 274.01. White crystalline powder. Solubility in water, 40% at 20°C. Slightly soluble in alcohol. Uses, in manufacture of ferric and other salts of methyl arsonic acid, manufacture of cacodylates, also used in pharmacy for effects similar to cacodylates, viz. as a tonic. Organic Products Co.

DRYORTH (Technically Anhydrous Sodium Orthosilicate)

Na_4SiO_4 (or) $2Na_2O.SiO_2$. Mol. Wt., 184.048. Molecular Ratio ($Na_2O:SiO_2$), 2:1. pH, 11.78 @ .01 N. Na_2O value, 60% to 61%. Physical appearance, granular white powder. Existing uses, heavy duty alkaline cleaning and degreasing of ferrous metals in steel mills and in other metal manufacturing and working plants. Also used as a detergent in textile mills, linen supply and rag washing plants. Can be used alone or with soaps, rosins, and synthetic emulsifying agents. This material is available in any desired quantities, packed in 400 lb. drums. Shipped under freight classification "Silicate of Soda—Dry." The Cowles Detergent Company.

DU PONT RIVETS

Material, aluminum alloy 17S-T, anodized. Sizes (nominal); $\frac{1}{8}$", $\frac{5}{32}$", $\frac{3}{16}$". Head Types, Brazier; 78°, 100° and 115° countersunk. Brazier; 100° countersunk. Brazier; 100° countersunk. The Du Pont Rivet, a type of fastener particularly adapted to "blind" riveting, is "set" by the application of a heated tool to the machine head. The resulting detonation of a small charge contained in the shank cavity expands the shank to form the closed head. Du Pont Rivets are finding wide application in the construction and field repair of aircraft. E. I. du Pont de Nemours & Company (Inc.).

ELASTOMER A.P.R.

A polymerized product from vinyl compounds and diphenyl derivatives. Actual formula has not been established. Yield value and film strength are lower than those for Elastomer A. P. S. Soluble in benzene or acetone or in mixtures of alcohol with petroleum hydrocarbons. Suggested uses, solvent type pressure sealing adhesive for temporary mountings or as a tackifier for some of the synthetic rubbers. Available only for uses carrying a high allocation rating. Monsanto Chemical Company.

ELASTOMER A.P.S.

A polymerized product from vinyl compounds and diphenyl derivatives. Actual formula has not been established. Product is a soft thermoplastic adhesive paste of excellent film strength at ordinary or slightly elevated temperatures. Both cohesion and adhesion are good. Soluble in benzene or acetone or in mixtures of alcohol with petroleum hydrocarbons. Suggested uses, solvent type pressure sealing adhesive for leather, textiles, paper, or wood. Available only for uses carrying a high allocation rating. Monsanto Chemical Co.

ELASTOMER EMULSION A.E.X.

A modified form of Elastomer Emulsion X which is a polymerized product made from vinyl compounds and diphenyl derivatives. Sp. Gr. of the emulsion is 0.99. Solids content is 49%. The action of the product is very similar to that of rubber latex for adhesive use, except that somewhat longer time of drying is necessary. After drying, the product gives tacky films which are suitable for mounting. The excess product may be rubbed off, as with latex. Bond strength increases on aging and after a few hours becomes as strong or stronger than latex bonds. This material shows a quicker action and greater bond strength than Elastomer Emulsion X. Suggested uses, as a pressure sealing adhesive suitable for use in the cold with leather, paper or textiles. Available only for uses carrying a high allocation rating. Monsanto Chemical Co.

ELASTOMER EMULSION X

An aqueous emulsion of a polymerized product made from vinyl compounds and diphenyl derivatives. Sp. Gr., of the emulsion is 0.93. The solids content is 43%. On drying, the material gives a tacky film which is suitable for mounting. Excess product may be rubbed off, as with latex or other rubber adhesives. Bond strength increases on aging. Suggested uses, as a pressure sealing adhesive for use in the cold with leather, paper, or textiles. Available only for uses carrying a high allocation rating. Monsanto Chemical Co.

EMCOL CA

A cream colored, waxy, hard solid with a faint, pleasant odor, a glyceride of palmitic and stearic acids with free hydroxy groups. The iodine value of the fatty acid constituent is less than 3. It disperses easily in water and is self-emulsifying. 1% dispersion has a pH of 8.9, and a surface tension of 43.9 dynes/cm. Free fatty acid, expressed as oleic acid 10% to 11%; specific gravity 1.02; titre 57° to 58°C. This product contains from 10% to 12% of potassium stearate (not added), an integral component of the reaction. Uses, preparation of oil-in-water emulsions for pharmaceutical, and cosmetic creams and lotions. It is used in the preparation of greaseless creams such as cold creams, brushless shaving creams, hand lotions, liquid balms, and lotions. It imparts fine emolient properties. Emcol CA imparts excellent stabilizing properties to beeswax creams when used as an addition agent in quantities of 1 to 2%. The Emulsol Corp.

EMCOL CD

C_{16} and C_{18} fatty acid esters of a polyglycol. A cream colored to almost white, waxy, soft solid practically odorless. The iodine value of the fatty acid constituent is less than 3. Disperses with extreme ease in water and is self-emulsifying. A 1% dispersion has a pH of 8.5-9 and a surface tension of 41 dynes/cm. Free fatty acid expressed as oleic acid 10% to 11%; specific gravity 1.01; titre 52° to 53°C. This product contains from 10% to 12% of potassium stearate (not added), an integral component of the reaction. Uses, preparation of oil-in-water emulsions for pharmaceutical, and cosmetic creams and lotions. It is used in the preparation of greaseless creams such as cold creams, brushless shaving creams, hand lotions, liquid balms, and lotions. It imparts fine emolient properties. Emcol CD imparts excellent stabilizing properties to beeswax creams when used as an addition agent in quantities of 1 to 2%. The Emulsol Corp.

EMCOL CE

A high molecular fatty acids ester of a glycol. Almost white, waxy, soft solid with a very faint pleasant odor. Disperses in water completely. A 1% dispersion has a pH of 8.5-9 and a surface tension of 42.1 dynes/cm. Free fatty acid expressed as oleic acid 10% to 11%; specific gravity 1.04; titre 51° to 52°C. This product contains from 10% to 12% of potassium stearate (not added) an integral component of the reaction. Uses, preparation of oil-in-water emulsions for pharmaceutical, and cosmetic creams and lotions. It is used in the preparation of greaseless creams such as cold creams, brushless shaving creams, hand lotions, liquid balms, and lotions. It imparts fine emolient properties. Emcol CE imparts excellent stabilizing properties to beeswax creams when used as an addition agent in quantities of 1 to 2%. The Emulsol Corp.

EMCOL DS

A polyglycol stearate. White, practically odorless waxy soft solid. Disperses easily in water. 1% dispersion has a pH of 7.1. Contains no soap or amines. Free fatty acid expressed as oleic acid 0.2% to 0.5%; specific gravity 0.99; titre 43° to 44°C. Uses, emulsifier for oil-in-water emulsions especially of the neutral type. Cosmetic detergent. The Emulsol Corp.

EMCOL EMS

A combination of an edible sulfoacetate derivative and fatty acid ester of a polyhydroxy alcohol. White, waxy-hard solid, practically odorless. 1% dispersion has a pH of 6.9. Free fatty acid expressed as oleic acid 2% to 3%; specific gravity 0.97; titre 56° to 57°C. (Contains no soap.) Uses, edible emulsifier for food, pharmaceutical and cosmetic emulsions. Toxicity, non-toxic and innocuous. U.S. Patent Reissue #21,683 and others. The Emulsol Corp.

EMCOL ES

A glycol stearate. A cream colored, practically odorless, wax-like solid. 1% dispersion has a pH of 5.15. Free fatty acid expressed as oleic acid 9% to 10%; specific gravity 1.01; titre 48°C. to 49°C. (Contains no soap). Uses, addition agent to other emulsifiers to promote more stable oil-in-water emulsions. Cosmetics and pharmaceuticals. The Emulsol Corp.

EMCOL L

The mono-glyceride of C_{12} fatty acid. Almost white to cream colored, medium hard, waxy solid with a slight stearine like odor. A 1% dispersion has a pH of 6.3. Contains no soap or amines. It is an edible substance. Free fatty acid expressed as oleic acid 2% to 3%; specific gravity 1.02; titre 53° to 54°C. Uses, edible emulsifier for cosmetics, pharmaceuticals, salves, ointments and foods. Toxicity, non-toxic. The Emulsol Corp.

EMCOL PL

A polyhydroxy laurate with strong hydrophillic properties. Pale yellow, clear mobile liquid, with faint odor. Disperses easily in cold water. A 1% dispersion has a pH of 5.9 and a surface tension of 26.9 dynes/cm. Free fatty acid expressed as oleic acid 0.1% to 0.5%; specific gravity 0.94. (Contains no soap). Uses, edible grade, emulsifier and wetting agent with excellent interfacial modifying properties. Used in food, cosmetics and pharmaceutical emulsions. Toxicity, non-toxic. The Emulsol Corp.

EMCOL O

A mono and di-glyceride of C_{18} liquid fatty acids. Clear viscous liquid. It is amber to light brown in color and has a pleasant caramel-like odor. Gives a milk-like emulsion on homogenization. A 1% dispersion has a pH of 8.7. Free fatty acid expressed as oleic acid 2% to 3%. (Contains no soap). Uses, edible emulsifier for food and cosmetics. Can be used as an auxiliary emulsifier with other emulsifying agents. The Emulsol Corp.

EMCOL PO

Oleic acid ester of a polyhydroxy alcohol. A clear mobile liquid, amber colored, with only slight odor. 1% dispersion has a pH of 6.3 and a surface tension of 34.3 dynes/cm. (Contains no soap.) Free fatty acid expressed as oleic acid 7% to 8%; specific gravity 0.93. Uses, edible grade emulsifying agent, for food, cosmetics and pharmaceuticals. Toxicity, non-toxic. The Emuslol Corp.

For your convenience in asking for more detailed information on

EMCOL PS

Stearic acid ester of a polyhydroxy alcohol. A white colored, wax-like solid, practically odorless. Free fatty acid expressed as oleic acid 3% to 4%. (Contains no soap.) Uses, edible emulsifier for food, cosmetics and pharmaceuticals. Toxicity, non-toxic. The Emulsol Corp.

EMCOL RE

A mixture of a mono and di-glyceride of hydrogenated fatty acids. A white hard wax. Edible grade. Slight caramel odor. 1% dispersion has a pH of 8-8.5. Free fatty acid as oleic acid .5% to 1%; specific gravity 1.01. (Contains no soap.) Uses, edible glyceride for use in food, cosmetic and pharmaceutical emulsions. Hardener. The Emulsol Corp.

EMCOL S

A mixture of mono and di-glycerides of saturated C_{16} and C_{18} fatty acids. Practically odorless and creamy white, waxy hard solid. 1% dispersion has a pH of 6.7. (Contains no soap or amines.) The fatty acid constituent has an iodine value of less than 3. Free fatty acid expressed as oleic acid 2% to 3%; specific gravity 1.01. titre 56° to 57°C. Uses, edible glyceride for use in food, cosmetic and pharmaceutical emulsions, salves and ointments. The Emulsol Corp.

EMCOL X-1

An anionic wetting agent, soluble in oil and freely dispersible in water. It has pronounced wetting out, detergent and emulsifying properties. Uses, textile processing, dispersing agent for insecticides, flotation reagent in the mining industry, particularly in the flotation of tungsten ores. In conjunction with crude oil or oleic acid, it is an excellent agglomerating agent for potassium chloride from sylvinite. It is a frother with a minimum of collecting properties for either sulfide or non-sulfide ores and is compatible with water of all degrees of hardness; it may be used in acid, neutral or alkaline circuits. The Emulsol Corp.

EMCOL 3-L PURE

A water soluble cationic reagent with good foaming and detergent properties in acidic pH. Uses, in textile and fur processing; in acid cosmetics; as flotation reagent in the mining industries; for example, floating of silica from phosphates, manganese ores, etc. The Emulsol Corp.

EMCOL 3-S PURE

A cationic reagent with good foaming and detergent properties in acidic pH. Less soluble in cold water than Emcol 3-L. Use, excellent acid emulsifier. The Emulsol Corp.

EMCOL 12

A fatty acid ester of a polyhydroxy alcohol containing 3 free hydroxy groups. Clear viscous liquid, amber-colored and slightly caramel odor. Disperses easily and a 1% dispersion has a pH of 7.05. Free fatty acid expressed as oleic acid 4% to 5%; specific gravity 1.01. (Contains no soap.) Uses, edible, innocuous emulsifier for pharmaceutical, cosmetic and food emulsions. Non-ionic wetting agent and detergent. Toxicity, not toxic. The Emulsol Corp.

EMCOL 14

A liquid fatty acid ester of a polyhydroxy alcohol, containing esters with more than 3 unesterified hydroxy groups, similar to Emcol 12. Clear viscous liquid, amber colored and slightly caramel odor. Disperses readily. 1% dispersion has a pH of 8.3 and a surface tension of 32.7 dynes/cm. Free fatty acid expressed as oleic acid 0.5% to 1%; specific gravity 0.99. (Contains no soap.) Uses, edible emulsifier for food, cosmetics and pharmaceuticals. Toxicity, non-toxic. The Emulsol Corp.

EMCOL 18

A palmitic and stearic ester of a polyhydroxy alcohol, similar to Emcol 12. Cream colored, wax-like solid with a slight caramel odor. Disperses easily. 1% dispersion has a pH of 7.5-8. Free fatty acid expressed as oleic acid 2% and

Emcol 18 (Cont'd)

3%. (Contains no soap.) Uses, edible hardener and emulsifying agent, for food, cosmetic and pharmaceutical emulsions, lipsticks and base for dye dischargers. The Emulsol Corp.

EMULSIFIER L-30

A vinylite resin emulsion. Jacques Wolf and Company.

EMULSIFIER L-34 A

Glycol ester. Jacques Wolf and Company.

EMULSIFIER L-39

Glycol condensation product. Jacques Wolf and Company.

EMULSION 19

Resin-modified nitrocellulose emulsion. Dries to a flexible, bright, non-tacky, waterproof film. Employed extensively to seal pile in pile fabrics. Useful as a binder, size or top coat for leather and will iron or plate with ease. American Resinous Chemicals Corporation.

EMULSION 42-5 D

Vinylite type. Good flexibility. Serves as a general adhesive base. Utilized as base coat beneath lacquer for coating cloth for the manufacture of artificial leather. American Reisnous Chemicals Corporation.

EMULSION 58-8 DS

Modified vinyl resin emulsion. Complete replacement for latex for many purposes. Excellent flexibility. Used in adhesives, coatings and impregnants for paper. American Resinous Chemicals Corporation.

EMULSION 58-17 A

Resin-modified nitrocellulose lacquer emulsion. Permanently tacky adhesive possessing good strength. American Resinous Chemicals Corporation.

EMULSION 59-12

Vinyl type. Complete substitute for shellac in impregnation of felt or wool hat bodies. Eliminates all clogging buffing papers. Good handle and excellent resilience. American Resinous Chemicals Corporation.

EMULSION 71-10 C

Latex adhesive extender. Compounded emulsion for shoe and similar adhesives. Permanently tacky. The addition of very small amounts of latex gives excellent strength for a wide variety of uses. American Resinous Chemicals Corporatiocn.

EMULSION 72-27 F

Latex substitute. Inexpensive vinyl type resin emulsion. Excellent adhesive base. Soft flexible film. Useful for impregnation of paper and cloth. Filler and binder for split and grain leathers. American Resinous Chemicals Corporation.

EMULSOL 607

A fine crystalline powder. It is a quarternary ammonium derivative of the pyridine-betaine type. 10% aqueous solution is a pale amber to substantially colorless solution and a 1% concentration is water white. Practically odorless. A 1% solution has a pH of 4 and a surface tension of 36 dynes/cm. Uses, general antiseptic and germicide against both gram-positive and gram-negative organisms. Extremely effective in very dilute solutions. Can be used in pharmaceuticals and cosmetics. In preparations such as hair washes, antiseptic creams and lotions, tooth powders, tooth pastes, etc. In the sterilization of food utensils, dairy equipment. Promotes oil-in-water emulsions. The Emulsol Corp.

EMULSOL 607 (10% AQUEOUS SOLUTION)

A fine crystalline powder. It is a quarternary ammonium derivative of the pyridine-betaine type. 10% aqueous solution is a pale amber to substantially colorless solution. Practically odorless. Uses, general antiseptic and germicide against both gram-positive and gram-negative organisms. Extremely effective in very dilute solutions. Can be used in pharmaceuticals and cosmetics. In preparations such as hair washes, antiseptic creams and lotions, tooth powders, tooth pastes, etc. In the sterilization of food utensils, dairy equipment. Promotes oil-in-water emulsions. The Emulsol Corp.

ETHYLENE CYANOHYDRIN

$HOCH_2CH_2CN$. Mol. Wt., 71.05. Clear, colorless moderately viscous liquid. M.P.46°C. B.P. 221°C. Decomposes slowly when distilled at atmospheric pressure at 760 mm. Density 1.0404 at 25°C. Soluble in water, acetone, ethanol, chloroform. Insoluble in benzene, carbon tetrachloride, naphtha. Solvent for many inorganic salts. Ethylene cyanohydrin undergoes dehydration to form acrylonitrile, and hydrolysis to form hydracrylic acid. With these two reactions in mind, ethylene cyanohydrin appears to be an interesting intermediate and the ramifications of its derived products are many and varied. American Cyanamid & Chemical Corp.

ETHYLENE DIAMINE, N-STEARYL, N'-GLYCOLYL-(S446)

Empirical formula, $C_{22}H_{42}O_3N_2$. Mol. Wt., 384.5. Consistency, hard wax-like solid. Color, dark tan. M. P., 120-127°C. Soluble in hot toluene, naphtha, turpentine, mineral and vegetable oils. Solutions gel on cooling. Suggested uses, as wax in polishes, coatings, etc. Glyco Products Co, Inc.

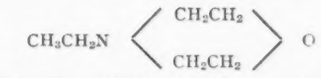
ETHYLENE GLYCOL MONOGLYCOLLATE (S421)

Empirical formula, $C_4H_8O_4$. Mol. Wt., 120.1. Consistency, liquid. Color, yellow. Soluble in water, ethanol. Volatility @ 105°, negligible. Compatible with cellulose acetate, nitrocellulose. Suggested uses, humectant, hydraulic fluid, antifreeze, solvent. Glyco Products Co., Inc.

ETHYL MONOCHLORACETATE

$C_4H_7O_2Cl$. Mol. Wt., 122.56. Colorless liquid. B. P., 143.6°C. @ 760 mms., 22.0°C. @ 10 mms. M. P., —26.0°C. Sp. Gr., 1.1585 @ 20°/4°. Uses as a solvent or intensifier. Heyden Chemical Corp.

n-ETHYL MORPHOLINE



Mol. Wt., 115.17. Sp. Gr. at 20/20°C., 0.916. Colorless, water-miscible liquid boiling at 138°C. Uses, cyclic tertiary amine useful as a solvent for dyes, resins and oils, and as an intermediate in the manufacture of dyestuffs, pharmaceuticals, rubber accelerators, and emulsifying agents. Available only in research quantities. Carbide and Carbon Chemicals Corporation.

ETHYL-2-PHENYL BUTYRATE

Empirical formula, $C_{12}H_{16}O_2$. Mol. Wt., 192.128. Boiling Range, 125-130°C. Water-white liquid. Solubility, insoluble in water, soluble in alcohol, ether. Use, possible perfume base, organic syntheses. Availability, made up to order. The Edwal Laboratories, Inc.

ETHYL SILICATE SILICA SOL

Analysis, SiO_2 total, 39.9%; SiO_2 free, 15.6%; ethyl silicate, 84.4%. Sp. Gr., 1.06 @ 25°C. Laboratory samples available. Monsanto Chemical Co.

any of these products we suggest the use of coupon on page 573.

ETHYL XANTHIC ACID ANHYDRIDE

M. P., 54°C. Soluble in ether, carbon bisulfide, benzol and toluene. Insoluble in water. Appearance, yellow solid. Suggested use, as a plasticizing agent for rubber. Available in sample quantities only. Monsanto Chemical Co.

EX-GEN (Plant Alkaloid)

This is a plant extraction of a new alkaloid of unknown formula. It is a vaso-dialator having unusual medicinal properties, particularly in connection with the correction of either high or low blood pressure. The material is available only in small quantities for experimental investigation. Rare Chemicals Research.

"FABRIKOID"

Pyroxylin coated and impregnated fabric for book bindings, ladies' handbags, furniture upholstery, ladies' shoes, luggage, case coverings, and novelties. For civilian use. E. I. du Pont de Nemours and Company, Inc.

"FABRILITE"

Synthetic resin coated fabric for hospital sheeting, raincoats, rainsuits and paulins. For war work only. E. I. du Pont de Nemours and Company, Inc.

"FAIRPRENE"—CEMENT

Neoprene cement for cementing cured and uncured neoprene, cured and uncured rubber, leather fabric, and paper. For war work only. E. I. du Pont de Nemours and Company, Inc.

"FAIRPRENE"—COATED FABRICS

Made from synthetic elastic compositions for gaskets, oil seals, diaphragms, shock mountings. For war work only. E. I. du Pont de Nemours and Company, Inc.

"FAIRPRENE"—SHEET STOCK

Made from synthetic elastic compositions for self-sealing gas tanks. For war work only. E. I. du Pont de Nemours and Company, Inc.

FENCHONE

$C_{10}H_{16}O$. Mol. Wt., 152. A dicyclic ketone, an isomer of camphor with camphor-like odor. Sp. Gr. at 15.5/4°C., .9480. Refractive Index at 20°C., 1.4630. Optical Rotation, 7.4+. Engler Boiling Range, 193 to 198°C. Uses, camphor alternate, plasticizer for cellulose esters, solvent for resins. Newport Industries, Inc.

FERMATE

(An organo-metallic fungicide)

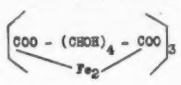
A finely divided water insoluble powder consisting of 70% of ferric dimethyldithiocarbamate and 30% of conditioning agents. Uses, for the control of fungus diseases on important agricultural crops such as apples, cherries, both sweet and sour, tobacco, celery and tomatoes, especially seed bed plants of tobacco, celery and tomatoes. E. I. du Pont de Nemours & Company, (Inc.).

FERRIC ORTHOPHOSPHATE

Empirical formula, $FE_3H_3(PO_4)_4.6H_2O$. Fe, 25.4%; P_2O_5, 42.4%. Appearance, fine white powder. Apparent density, 0.297. Solubility in water, 0.00024 gm. Fe per 100 cc. water. Solubility in 0.2% HCl, 0.00092 gm. Fe per 100 cc. solution. Solubility in 1.0% HCl, 0.026 gm. Fe per 100 cc. solution. Suggested uses, as iron addition agent for the mineral enrichment of foods. Available in limited quantities. Monsanto Chemical Company.

FERRIC SACCHARATE

Mol. Wt., 735.68.



Very soluble in water, hygroscopic. Odor, none. Color, dark green. Suggested use, hematinic, tonic. Available in commercial quantities. Brocker Chemical Co.

FERRIC SULFATE, Quick Soluble

Empirical formula, $Fe_2(SO_4)_3$. Typical analysis: $Fe_2(SO_4)_3$, 75.15%; $FeSO_4$, 1.15%; Fe_2O_3 basic, 0.30%; insolubles, 0.07%. Laboratory samples available. Monsanto Chemical Co.

FILTRAWAX

A fully amorphous petroleum wax, tacky, free from oil and moisture. M. P., 128/132°F. AMP., penetration at 77°F., 50/60. Saybolt viscosity at 210°F., 50/55. Flash, 460/470°F. Produced in three (3) colors, white, amber and olive. Petroleum Specialties, Inc.

FLAMEPROOFING AGENT S361

A water-white liquid with the consistency of water. Odorless. Used as a flameproofing agent for textiles and paper, where the elimination of after-glow is an important factor. Glyco Products Co., Inc.

"FLEXOL" PLASTICIZER DOP (Di-2-Ethylhexyl Phthalate)

Stable, light colored, high-boiling, (216°C. at 5 mm.) liquid which is miscible with most organic solvents but is almost insoluble in water. Its evaporation rate is considerably lower than butyl phthalate. Uses, excellent plasticizer for "Vinylite" resins, particularly the copolymer and polyvinyl chloride types; and it is compatible with nitrocellulose and polystyrene and urea-formaldehyde resins. Films of "Vinylite" resins plasticized with it have good low temperature flexibility, satisfactory light stability and excellent electrical properties. Carbide and Carbon Chemicals Corp.

FLUORENONE

Empirical formula, $C_{13}H_8O$. Mol. Wt., 180.06. M. P., 72-75°. Yellow crystals. Solubility, soluble in alcohol and ether. Insoluble in water. Uses, organic syntheses. Availability, made up to order. The Edwal Laboratories, Inc.

N-FORMYL-o-AMINODIPHENYL, Technical

Empirical formula, $C_{12}H_9NHCOH$. Mol. Wt., 197. Crystallizing pt., approx. 72°C. Appearance, slightly colored solid. Soluble in ethyl alcohol, benzene and acetone. Insoluble in water. Is 100% compatible with nitrocellulose. Imparts flexibility, extensibility, and toughness to nitrocellulose compositions. Weight for weight, imparts greater water resistance to nitrocellulose than does dibutyl phthalate. Available only in small quantities for experimental investigation. Monsanto Chemical Co.

G-220

A plasticizer. A methyl ethyl ketal of sorbitol. Clear, almost colorless syrupy liquid with a characteristic mild odor. Insoluble in water, very soluble in most organic solvents, compatible with and used as a plasticizer for polyvinyl acetate and polyvinyl butyral. Boiling Point about 150°C. at 4 mm. Shipped in 1, 5 and 10 gallon cans and 55 gallon drums, 9.0 lb./gal. Atlas Powder Company.

G-1050

A 33% solution of a complex chromium compound in an organic solvent. Soluble in water and alcohol. Color, dark green. Chemical properties, stable in aqueous solution below pH 5.0, precipitated by alkalis and polyvalent anions. Various types of surfaces may be rendered water-repellent by the application of a dilute aqueous solution of G-1050, followed by drying at elevated temperature. Suggested uses, as a water-repellent finish for textiles and paper; insolubilization of water-sensitive coating materials. Available in quantities sufficient for laboratory and small-scale plant evaluation. E. I. du Pont de Nemours & Company (Inc.).

G-2400

A plasticizer. A propionic acid ester of anhydro sorbitol. Clear, light yellow, thin liquid, slightly soluble in water and readily soluble in most organic solvents. Compatible with vinyl resins. It is recommended as a softener for certain synthetic rubbers, particularly the butadiene-acrylonitrile type. Shipped in 1, 5 and 10 gallon cans and 55 gallon drums, 9.7 lb./gal. Atlas Powder Company.

G-2520

A plasticizer. A mixed acetic-butyric ester of anhydro sorbitol. Clear, light yellow, thin liquid slightly soluble in water, soluble in most organic solvents. Compatible with several vinyl resins. Used as a plasticizer for cellulose acetate and mixed cellulose esters. Shipped in 1, 5 and 10 gallon cans and 55 gallon drums, 9.7 lb./gal. Atlas Powder Company.

G-2800

An emulsifier. A partial oleate ester of a polyhydroxy mannitol ether. Clear, lemon colored oil, dispersible in water and readily soluble in vegetable oils. Used in solutions of such oils as sesame and cottonseed to make them water dispersible. Shipped in 1, 5 and 10 gallon cans and 55 gallon drums, 8.5 lb./gal. Atlas Powder Company.

G-2920

A plasticizer. A mixed laurate propionate ester of a polyhydroxy sorbitol ether. Clear, lemon colored, fairly mobile liquid. Insoluble in water; soluble in most organic solvents, and compatible with many natural resins. Used as a plasticizer for cellulose nitrate. Shipped in 1, 5 and 10 gallon cans and 55 gallon drums; 8.5 lb./gal. Atlas Powder Company.

G-9096-D

A water dispersible wax. A stearate ester of a polyhydroxy ether of anhydro sorbitol. A tan, medium hard wax having a melting point of about 36°C. Dispersible in water and soluble in some oils. Particularly useful as a wax base in pharmaceuticals (suppositories, etc.). Shipped in 5, 25, 50 and 85 lb. containers; specific gravity is 1.59. Atlas Powder Company.

GEM QUALITY AMORPHOUS MINERAL WAX

Color, amber. Flash point, 550. Fire, 620. Viscosity, 84. M. P., 185 plus. Penetration, 20. American Wax Sales Corp.

GLYCERYL DILACTATE (S580)

Empirical formula, $C_9H_6O_7$. Mol. Wt., 236.3. Consistency, liquid. Color, yellow. Soluble in water, alcohol, acetone, ethyl acetate. Insoluble in hydrocarbons. Suggested uses, humectant. Glyco Products Co., Inc.

GLYCERYL DILEVULINYL TRI-RICINOLEATE (S634)

Empirical formula, $C_{67}H_{116}O_7$. Mol. Wt., 1129.5. Consistency, liquid. Color, yellow. Sol. in alcohol, acetone, ethyl acetate, toluene, naphtha. Insol. in water, mineral oil. Compatible with ethyl cellulose, vinyl resins. Suggested uses, plasticizer, lubricant, solvent. Glyco Products Co., Inc.

GLYCERYL DILEVULINATE (S488)

Empirical formula, $C_{13}H_{18}O_7$. Mol. Wt. 288.1. Consistency, liquid. Color, amber. Soluble in ethanol, acetone, ethyl acetate, toluene, chloroform. Insoluble in water, carbon tetrachloride, naphtha. Volatility @ 105°C., negligible. Compatible with cellulose acetate, vinyl resins. Suggested uses, plasticizer. Glyco Products Co., Inc.

For your convenience in asking for more detailed information on

GLYCERYL HEXARICINOLEATE (S565)

Empirical formula, $C_{105}H_{200}O_9$. Mol. Wt., 1774.8. Consistency, liquid. Color, amber. Soluble in acetone, naptha, toluene, mineral oil, vegetable oil. Insoluble in ethanol, isopropanol, water. Suggested uses, lubricant, emulsifying agent for water in oil emulsions, hydraulic fluid. Glyco Products Co., Inc.

GLYCERYL MONORICINOLEATE (S125)

Empirical formula, $C_{21}H_{40}O_5$. Mol. Wt., 372. Consistency, oil. Color, amber. Sp. Gr., 0.98 @ 25°C. Sap. Val., 152-157. Iod. Val., 71-75. Solidif. Point, below —50°C. Miscible with alcohol, acetone, ethyl acetate. Immiscible with water, naphtha, and mineral oil. Partially compatible with toluene, vegetable oil. Suggested uses, plasticizer for synthetic rubbers, particularly where resistance to greases and oils is desired, and for low temperature work. Glyco Products Co., Inc.

GLYCOPON 10

Glycerin substitute. Consistency, liquid of glycerin viscosity (approximate). Color, amber. pH (5% solution), 2.6. Volatility, loses 3% (4 hrs. @ 105°C.). Freezing Point (50% aq. solution), —8 to —10°C. Strongly hygroscopic. Miscible with water, alcohol and glycerin. Immiscible with hydrocarbons. Suggested uses, glycerine substitute for use in acid media. Glyco Products Co., Inc.

GLYCOPON 20

Glycerin substitute. Consistency, liquid. Color, amber. pH (5% solution), 2.75. Volatility, loses 5% (4 hrs. @ 105°C.). Freezing Point (50% aq. solution), —16 to —17°C. Hygroscopic. Miscible with water, alcohol, and glycerin. Immiscible with hydrocarbons. Suggested uses, glycerin substitute for use in media. Glyco Products Co., Inc.

GLYCOPON 30

Glycerin substitute. Consistency, liquid. Color, straw. pH (5% solution), 2.5. Volatility, loses 8% (4 hrs. @ 105°C.). Freezing Point (50% aq. solution), —7 to —10°C. Very hygroscopic. Miscible with water, alcohol, and glycerin. Immiscible with hydrocarbons. Suggested uses, glycerine substitute for use in acid media. Glyco Products Co., Inc.

GLYCOPON 40

Glycerin substitute. Consistency, liquid. Color, amber. pH (5% solution), 4.4. Volatility, loses 2% (4 hrs. @ 105°C.). Freezing Point (50% aq. solution), —12 to —14°C.). Hygroscopic. Miscible with water, alcohol and toluene. Miscible hot with glycerin. Immiscible with petroleum hydrocarbons. Suggested uses, glycerine substitute for use in acid media. Glyco Products Co., Inc.

GLYCOPON 50

Glycerin substitute. Consistency, liquid of approximate glycerin viscosity. Color, straw. pH (5% solution), 6.5-7.5. Volatility, loses 24% (4 hrs. @ 105°C.). Very hygroscopic. Freezing Point (50% aq. solution), —23 to —24°C. Miscible with water, alcohol and glycerin. Immiscible with hydrocarbons. Suggested uses, a glycerine substitute to replace glycerine in neutral alkaline solutions. Because of its low freezing point, is of considerable interest for anti-freeze purposes. Glyco Products Co., Inc.

GLYCOPON 60

Glycerin substitute. Consistency, liquid. Color, pale yellow. pH (5% solution), 6.5-7.5. Volatility, loses 21% (4 hrs. @ 105°C.). Freezing Point (50% aq. solution), —17 to —19°C. Very hygroscopic. Miscible with water, alcohol, and glycerin. Immiscible with hydrocarbons. Suggested uses, a glycerine substitute to replace glycerine in neutral and alkaline solutions. Because of its low freezing point, is of considerable interest for anti-freeze purposes. Glyco Products Co., Inc.

GLYCOPON 70

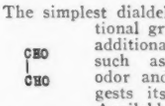
Glycerin substitute. Consistency, liquid. Color, water-white. pH (5% solution), 7.9. Volatility, loses 39% (4 hrs. @ 105°C.). Freezing Point (50% aq. solution), —8 to —10°C. Mildly hygroscopic. Miscible with alcohol and hydrocarbons. Suggested uses, a cheap glycerine substitute where ultimate drying is not an important factor. Glyco Products Co., Inc.

GLYCURONIC ACID

Assumed formula — CHO. [CH (OH)]$_4$. COOH. Mol. Wt. unknown. This is a polymer of unknown tie-up. It is a dirty white material without odor. This particular polymer differs from commercial glycuronic acid generally made from sugars in that it is the same composition as glycuronic acid found in the blood which acts as a haemostyptic agent and has healing properties and at the same time tends to throw off toxins from cuts and wounds. This material thus far is available only in small quantities for experimental investigation. Rare Chemicals Research.

GLYOXAL

The simplest dialdehyde. Containing two functional groups, it reacts in many ways additional to those of monoaldehydes such as formaldehyde. Minimum odor and relative non-volatility suggests its use in many applications. Available in research quantities as a 30-40 per cent aqueous solution and as a solid bisulfite addition compound. Uses, it shows promise as an insolubilizing agent for compounds containing free amino and hydroxyl groups such as glues, casein, albumin and high molecular weight polyalcohols. Reacts with aromatic diamines, amino phenols and hydrazines to give insoluble colored materials. Reaction products from ammonia and aliphatic amines are of potential interest to the petroleum and pharmaceutical industries. Slight modification of these reactions produces high molecular weight compounds having interesting resin-forming properties. Carbide and Carbon Chemicals Corporation.

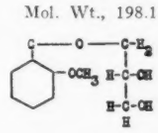


GLYOXAL SULFATE

$C_2H_2(SO_4)_2$. Mol. Wt., 218.2. M. P., 176°C. White needles. Slightly soluble in cold water, but markedly soluble above about 50°C., with slow decomposition. Chemical properties, liberates glyoxal on hydrolysis. Suggested uses, insolubilization of cellulose, polyvinyl alcohol, and proteins by cross-linking, and for chemical syntheses requiring monomeric glyoxal. This compound is available only in small quantities for experimental investigation. E. I. du Pont de Nemours & Company (Inc.).

GUAIACOL GLYCERYL ETHER

Mol. Wt., 198.11. White crystalline powder. M. P., 78-79°C. Soluble in alcohol, chloroform, ether, and glycerine. Used in pharmacy as an internal antiseptic. Organic Products Co.



HALOGEN TIN PLATING SALTS

A chemical preparation containing halides for preparation of high speed tin plating solution, operatable at 100% cathode and anode efficiencies. One and three-quarters pounds per gallon are used in conjunction with addition agents. Solution is operated at elevated temperatures (132°-150°F.) in rubber or lead lined tanks. E. I. du Pont de Nemours & Company, (Inc.).

HEXAMETHYLENE TETRAMINE ANHYDROMETHYLENE-CITRATE

Empirical formula, $C_{13}H_{20}N_4O_7$. Mol. Wt., 344.19. M. P., 165-170°C. White crystalline powder. Solubility, soluble in 10 parts of water; very slightly soluble in alcohol, ether. Decomposed by acids or alkalies with the liberation of formaldehyde. Uses, medicinal. Availability, stock. The Edwal Laboratories, Inc.

HEXYL ETHER

$C_6H_{13}OC_6H_{13}$. Mol. Wt., 186.33. Sp. Gr. at 20/20°C., 0.7942. Flash P., 170°F. Mild-odored, stable liquid which possesses a high boiling point (226.2°C.) and is much less volatile than lower members of the ether group. Has an extremely low solubility in water. Uses, a convenient medium for chemical reactions which are carried out in a strictly anhydrous ethereal vehicle. A component of foam breakers and an inert reaction medium. Carbide and Carbon Chemicals Corporation.

HIGH FOAM

A pure crystalline sulfoacetamide derivative. White crystalline. Odorless. 1% in water gives a water white solution at 30°C. Wetting time of a 0.1% solution 26 seconds (Draves test). 1% solution has a pH of 5-5.5 and a surface tension of 36.7 dynes/cm. Uses, wetting and foaming agent extensively used in tooth paste and tooth powder. Foamer and detergent for use in cosmetics and pharmaceuticals where soap is indicated as undesirable. Pharmacological tests show High Foam to be less irritating in dentrifices than soap. U.S. Patents #2,184,770 and 2,236,541. The Emulsol Corp.

HIGH SPEED COPPER PLATING SALTS

A compound containing sodium copper cyanide for preparation of rapid copper plating solutions. Smooth, lustrous deposits are obtainable at 100% cathode and anode efficiencies. Two and one-quarter pounds per gallon are used in conjunction with caustic soda or caustic potash and addition agents. Solution is operated at elevated temperatures (165°-185°F.) in unlined steel equipment. E. I. du Pont de Nemours & Company, (Inc.).

HYDROXYLAMMONIUM CHLORIDE

$NH_2OH.HCl$. Hydroxylammonium Chloride is the latest addition to the family of hydroxylammonium salts, the sulfate and acid sulfate having been placed in commercial production last year. In many organic syntheses utilizing Hydroxylamine, the reactions are preferably carried out in a liquid medium other than water. In such cases Hydroxylammonium Chloride can be used to advantage since it is more soluble in organic liquids than the acid or neutral sulfate. The availability of Hydroxylamine at reasonable prices is stimulating active investigation of the many old as well as new reactions involving this compound. Among those mentioned in the technical and patent literature are the syntheses of indigo, azo dyes, phenyl hydrazine the dioxime of succinic dialdehyde and many other complex organic chemicals. Hydroxylamine is also suggested for the purification of aldehydes and ketones; as a photographic developer; as a dehairing agent; and in the preparation of flotation agents. Properties: Melting Point. 152°C. (melts with decomposition). pH of 0.1 M Aqueous Solution at 25°C., 3.4. Solubility, grams per 100 grams at 25°C. In H_2O, 94.7. In 95% C_2H_5OH, 10.5. In CH_3OH, 17.5. Commercial Solvents Corp.

2-HYDROXY-3-METHOXY BENZALDEHYDE, Technical

Empirical formula, $C_8H_8O_3$. Mol. Wt., 152. Crystallizing pt., 40.0°C. min. Density, 120 @ 50°C. Wt. per gal., 10 lbs. Appearance, yellowish crystalline solid. Suggested uses: Antioxidant and intermediate in chemical synthesis. Available in commercial quantities. Monsanto Chemical Co.

IONAC ION EXCHANGE RESINS

Two types are available: IONAC C-284 for cation exchange and IONAC A-293 for anion exchange. Both types are true synthetic products, used in the form of 10-60 mesh granules, and in appearance are hard, vitreous resins. The IONAC resins lend themselves to handling a variety of problems of purification, reclamation of small percentages of valuable dissolved constituents or diverse types of chemical reaction in dilute solution. American Cyanamid & Chemical Corp.

any of these products we suggest the use of coupon on page 573.

IRON CACODYLATE

$Fe[(CH_3)_2AsO_2]_3$. Mol. Wt., 466.7. Odorless brownish to greenish amorphous powder readily dissolving in water to give a clear stable solution. Used medicinally as a source of arsenic and iron. Edcan Laboratories.

ISOPHORONE

Empirical formula, $C_9H_{14}O$. Mol. Wt., 138.20. B.P. °C. (760 mm.), 215. M.P., °C., —12 to —13. Density, 20/4°C., 0.9211. Flash point, °F., 200. A yellowish liquid of pleasant odor. A singly unsaturated cyclic ketone, isophorone presents numerous possibilities for synthesis. Uses, the compound is an excellent solvent for a number of resinous materials and is extensively used in making protective coatings from vinyl polymers. Produced by Shell Development Co. Selling Agent, R. W. Greeff & Co., Inc.

ISOPRENE

C_5H_8. Mol. Wt., 68. Sp. Gr., 15.5/4°C., .6808. Refractive Index at 20°C., 1.4200. Engler Boiling Range, 34 to 36°C. Uses, synthetic rubber, synthetic resins, organic synthesis. Newport Industries, Inc.

ISOPROPANOLAMINE

$CH_3CH(OH)CH_2NH_2$. Mol. Wt., 75.08. Sp. Gr. at 20/20°C., 0.981. Boiling Point, 160°C. at 760 mm. Solubility in water, complete. Moderately viscous liquid. Uses, in manufacture of pharmaceuticals, and emulsifying agents for polishes, textile specialties, leather compounds, insecticides, cutting oils, and water paints. Carbide and Carbon Chemicals Corp.

ISOPROPYLAMINE

$CH_3CH(NH_2)CH_3$. The production of Isopropylamine makes available to chemists an interesting new raw material for important organic syntheses, such as the manufacture of dyestuffs, pharmaceuticals, insecticides, bactericides, surface active agents and textile specialties. The comparatively high solubilities of the higher fatty acid soaps of Isopropylamine in the organic solvents ordinarily used in cleaning preparations make this compound of particular interest to the manufacturers of such specialties. Also, the patent and technical literature suggests the use of Isopropylamine as a dehairing agent in the tanning industry. Isopropylamine being an anhydrous product can be shipped in drums. Properties: Color, water-white. Flash point, —36°C. (—32.8°F.). Boiling point, 31.9°C. M. P., —101.2°C. Mol. Wt., 59.11. pH of 0.1 M Aqueous Solution, 11.57. Sp. Gr., 0.686 at 25°C./4°C. Vapor Pressure, 385 mm. of mercury at 15°C. Solubility: Miscible with water, alcohol and ether. Commercial Solvents Corp.

JAPAN WAX SUBSTITUTE #525

M. P., 56-57°C. Acid No., 5.9. Sap. No., 182-187. Japan Wax Substitute No. 525 is being used to advantage replacing Japan Wax in the Textile Industry, Pencil Industry, Leather Industry, Laundry Industry, etc. Innis, Speiden & Co.

KASIL #2

Potassium silicate, 32° Baume. Molecular ratio, 1:3.92. Specially concentrated for use in manufacturing welding rods. Philadelphia Quartz Co.

KASIL #6

Potassium silicate, 40.5° Baume. Molecular ratio, 1:3.29. Used in welding rod coatings, paints, and non-blooming films. Philadelphia Quartz Co.

LACQUERED FABRIC TABLECLOTHS

Use, for washable table covers. For civilian use. E. I. du Pont de Nemours and Company, Inc.

LIGNIN KSA

Purified Lignin from paper pulp sulfate black liquor. Apparent density 20 to 30 lbs. per cu. ft. fusion point 250 to 275°C.; methoxyl content 10 to 15%; sulfur content 0.8 to 1.5%; ash content less than 0.3%. Soluble in dioxane and in alkaline solutions. Insoluble in water and in most acids and solvents. Suggested uses, in phenolic resins as an extender for phenols; in other resins where lignin combines with amines such as aniline aldehydes such as furfural; in resins as a filler; in battery plate compound; in rubber for compounding and as filler; in water treatment as base exchange compound and as corrosion inhibitor; in paints and varnishes as pigment and as vehicle ingredient; in cements as grinding aid and as ingredient; in mastics; in adhesives; in flotation reagents; in absorbents; in camouflage coatings. Available only for research and experimental evaluations. Output beginning July 1, 1942 0.5 lb. per day, beginning November 1, 20 lbs. per day, beginning February 1, 1943, 2,000 lbs. per day. Available potentially, one million tons per year. Industrial Chemical Sales Division, West Virginia Pulp and Paper Co.

LIGNIN KSC

A sodium half salt of crude lignin separated from paper pulp sulfate black liquor. Apparent density ranges from 25 to 35 lbs. per cu. ft. Fusion point from 200 to 250°C. Methoxyl content 8 to 13%, sulfur 0.8 to 1.5%. It disperses on water and is soluble in dilute alkaline solutions, insoluble in dioxane, most solvents and acids. Suggested uses, in lignin syntheses; in minerals flotation as absorbent and as reagent; in camouflage paints, in base exchange chemicals; in adhesives; in emulsifying agents; in cement as grinding aid; in drilling muds. Available only for research and experimental evaluation etc. as in other paper. Industrial Chemical Sales Division, West Virginia Pulp and Paper Co.

LIQUID NITROGEN TETROXIDE

N_2O_4. Mol. Wt., 92.02. Dark red liquid. Sp. Gr., 1.5. B. P., 21.15°C. F. P. (pure), 11.25°C. F. P. as supplied, 11.25-12.5°C. Very poisonous; corrosive in the presence of water. Shipping regulations, classified as a Class A poison by I. C. C. Must be shipped in I. C. C. —3D480 steel cylinders. Shipping containers, available in 10, 50 and 100 lb. net cylinders. Uses, as a special oxidizing and nitrating agent. E. I. du Pont de Nemours & Company (Inc.).

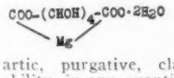
L. M. NYPENE RESIN

$(C_{10}H_{16})n$. Thermo-plastic terpene polymer. Sp. Gr., .980. Approximate mean molecular weight about 1,000. M. P., 100-120°C., pale color, low ash, odorless. Neutral, non-saponifiable. Resistant to water, acid, alkali, and alcohol. Excellent heat stability, and only slight yellowing on ultra violet exposure. Exceptional softening action and tack producing effect on rubber. Compatible with paraffin, natural and mineral waxes, polybutene, and synthetic resins. Soluble in all hydrocarbons. Uses, coatings, varnishes, rubber compounding, rubber cements, adhesives. Nypene is packed in drums, net weight approximately 400 pounds each. L. M. Nypene emulsions available in limited quantities. The Neville Co.

MAGNESIUM PYROPHOSPHATE

$Mg_2P_2O_7$. Mol. Wt., 222.68. Appearance, white crystalline powder. M. P., 1383°C. Insoluble in water; soluble in acids. Suggested uses, in ceramic industry as constituent of porcelains and enamels. Available for experimental investigation. Monsanto Chemical Co.

MAGNESIUM SACCHARATE



Mol. Wt., 268.3. Solubility, 0.02 gm./100 ml. water of 20°C. Odor, none. Color, white. Suggested use, substitute for citrate of magnesia, cathartic, purgative, clarifier for liquid. Availability, in any quantities. Brocker Chemical Co.

MAGNESIUM THIOSULFATE (Magnesium Hyposulfite)

$MgS_2O_3.6H_2O$. Mol. Wt., 244.53. White rhombic crystals. Loses $3H_2O$ at 170°C. Solubility, soluble in 2 parts water, insoluble in alcohol. Use, medicinal. Availability, made up to order. The Edwal Laboratories, Inc.

Para MENTHANE

Sp. Gr. at 15.5/4°C., .8110. Ref. Ind. at 20°C., 1.4420. B. Range, 171-172°C. Para menthane is derived chemically from commercial "dipentene" by a patented process. It is completely saturated. It is easily halogenated; the chlorine derivatives upon hydrolysis yield an interesting group of alcohols. Generally speaking, para menthane is not as good a solvent for resins as para cymene. Newport Industries, Inc.

2-MERCAPTO-4-PHENYL BENZO-THIAZOLE

M. P., 185-190°C. Soluble in dilute sodium hydroxide, benzol chloroform, chlorobenzene. Slightly soluble in alcohol. Appearance, buff powder. Suggested use, as an accelerator for rubber goods. Available in commercial quantities. Monsanto Chemical Co.

MERVAR

A non-volatile terpene polymer that dries in a few hours to a tough neutral film without loss in weight. The film becomes brittle with age. Uses, as a combined alternate for drying oils and resins for some purposes. It will not deleaf aluminum. Newport Industries, Inc.

3 METHOXY CHLOR ACRIDINE

$C_{14}H_9OCl_2N$. Mol. Wt., 278.05. Yellow powder. M. P., 163.5°C. Use, intermediate for organic synthesis. Heyden Chemical Corp.

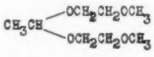
Para METHYL ACETOPHENONE

Sp. Gr. at 15.5/4°C., 1.0026. Ref. Ind. at 20°C., 1.5324. B. Range, 221 to 228°C. Para methyl acetophenone is derived from the hydrocarbon para-methyl alpha-methyl styrene. This ketone has a valuable odor and other properties for perfumery. It is furthermore a starting material for numerous synthetic aromatic compounds, principally due to its characteristic reactions of an aromatic ketone. Newport Industries, Inc.

METHYL "CARBITOL" ACETATE

$CH_3COOC_2H_4OC_2H_4OCH_3$. Mol. Wt., 162.18. Sp. Gr. at 20/20°C., 1.0396. Vapor Pressure, 0.1 mm. at 20°C. A colorless liquid, completely miscible with water. Uses, as a high-boiling (209.1°C.) solvent in cellulose ester lacquers and printing inks. Carbide and Carbon Chemicals Corporation.

METHYL "CELLOSOLVE" ACETAL



Boiling Point, 207.0°C. Sp. Gr. at 20/20°C., 0.9762. Flash Point, 205°F. Completely miscible with water. Uses, source of nascent acetaldehyde. It has promising solvent properties under neutral or slightly alkaline conditions. Carbide and Carbon Chemicals Corporation.

METHYLDIETHANOLAMINE

$CH_3N(C_2H_4OH)_2$. Mol. Wt., 119.16. Sp. Gr., 1.043 at 20/20°C. Refractive Index, 1.4699. Boiling Point (at 4 mm.), 121°C. Equivalent Weight, 119. Amine-odored, colorless liquid, miscible with water and benzene. Uses, suggested as an intermediate in the manufacture of textile auxiliaries, insecticides, emulsifying agents, and corrosion inhibitors. Shows some evidence of selective action in the absorption of acidic gases. Available only in research quantities. Carbide and Carbon Chemicals Corporation.

METHYL DIETHANOLAMINE

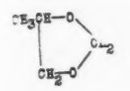
$CH_3N(CH_2CH_2OH)_2$. Mol. Wt., 119.2. M. P.,

Methyl Diethanolamine (Cont'd)

—19°C. Boiling Range, 246-248°C. Sp. Gr. @ 250°C., 1.037. Refractive Index @ 20°C., 1.468. Viscosity @ 25°C., 83 centipoise. Flash Point, 265°F. Color and form, water white liquid. Odor, amine. Soluble in water, methyl alcohol, ethyl ether, acetone, benzene, and ethyl acetate. Insoluble in gasoline. Uses, suggested as a raw material for making corrosion inhibitors, emulsifying agents and textile assistants. Availability, experimental quantities. Sharples Chemicals Inc.

4-METHYL DIOXOLANE

Mol. Wt., 88.06. Sp. Gr., 0.988 at 20/20°C. Boils at 85°C. 20 per cent soluble in water at 20°C. Colorless liquid. Uses, an extractant and solvent for oils, fats, waxes, dyestuffs, and cellulose derivatives, especially cellulose acetate. Available only in research quantities. Carbide and Carbon Chemicals Corporation.



METHYL IODIDE

CH_3I. Mol. Wt., 141.94. Sp. Gr., 2.28. B. P., 42.5. Colorless liquid. Soluble in about 60 parts water. Miscible in all proportions with alcohol and ether. Uses, as a methylating agent in organic syntheses and in pharmacy as a vesicant. Technical and C. P. grades. Organic Products Co.

Alpha-METHYL Para-METHYL STYRENE

Sp. Gr. at 15.5/4°C., .9038. Ref Ind. at 20°C., 1.5329. Boiling Range, 190 to 191°C. This hydrocarbon is especially interesting on account of the reactive character of the double bond in the side chain. For example, when mixed with styrene in molar proportions or less, it will copolymerize with styrene by heat or by catalysts to yield a resin very similar to that produced by styrene alone. Unlike styrene, however, it will not polymerize by heat alone or on standing at room temperature. Its copolymerization with other unsaturated materials like butadiene is also indicated. The catalytic polymerization of alpha-methyl para-methyl styrene alone produces a hard brittle resin of commercial possibilities. It can be efficiently combined with phenol to yield the para xylyl phenol, which in turn can be resinified to an oil soluble resin. Upon oxidation the hydrocarbon is converted to methyl acetophenone and formaldehyde. Newport Industries, Inc.

METHYL MONOCHLORACETATE

$C_3H_5O_2Cl$. Mol. Wt., 108.50. Colorless liquid. B.P., 129.9°C. @ 760 mms., 17.3°C @ 10 mms. M.P., —32.7°C. Sp. Gr., 1.238 @ 20°/4°. Uses as a solvent or intensifier. Heyden Chemical Corp.

n-METHYLMORPHOLINE

Mol. Wt., 101.15. Sp. Gr., 0.916. Boiling Point, 115.4°C. Completely miscible with water and benzene. Forms a constant boiling mixture which contains 25 per cent water and boils at 97°C. Uses, in the preparation of emulsifying agents for polishes benefited by the use of an emulsifier that becomes ineffective on drying. Available only in research quantities. Carbide and Carbon Chemicals Corporation.

2-METHYLPENTADIENE

C_6H_{10}. Mol. Wt., 82.14. Sp. Gr., 0.720 at 20°/20°C. Density, lb./gal. at 20°C., 6.0. Refractive Index $N^{20}D$, 1.4476. F. P., °C., below —75. Distillation Range, °C. (95%), 74-76. Flash Point, °C, below —40. 2-Methylpentadiene takes part in Diels-Alder reactions and it has many possibilities in co-polymerization reactions. Commercial Solvents Corp.

METSO ANHYDROUS

This is a technical grade of sodium metasilicate without water of crystalization. It is readily soluble and is especially sized to reduce dustiness. Used in the compounding of various mixtures. Philadelphia Quartz Co.

MOLDING WAX #583

M. P., 74-76°C. Penetration, 17-19. Molding Wax #583 has been developed as a substitute for Ozokerite for the Electrotypers replacing the Boryslaw Ozokerite Wax no longer available. Innis, Speiden & Co.

MONOALLYLAMINE (Primary Allylamine)

Empirical formula, C_3H_7N. Mol. Wt., 57.09. B. P., °C (769 mm.), 52.7. Density, 20/4°C., 0.7626. Flash Point, °F., below 32. Solubility in water, miscible. Azeotropes with water, none. A colorless liquid of amine odor. The reactivity of this amine is increased by the presence of an allylic double bond, imparting interesting possibilities for synthesis. Use, is at present used in the manufacture of pharmaceuticals. Monoallylamine is available in small quantities for experimental investigation. Shell Development Co., Selling Agent, R. W. Greeff & Co., Inc.

MONO CHLOR MALEIC ANHYDRIDE

Commercial product. Is a colorless to pale yellow liquid, partially solidifying in cool weather. M. P. (pure), 34.5°C. Setting Point of a seeded sample, 27°C. min. Purity by acidity titration, 97% min. B. P., 196.3°C./atm or 95°C./25 mm. Boiling Range, 192-199°C. Density, 25°/25°, 1.5421. Flash Point, 110°C. Fire Point, 115°C. National Aniline Division, Allied Chemical and Dye Corporation.

MONOETHYLAMINE STEARATE

$C_{17}H_{35}COONH_3C_2H_5$. Mol. Wt., 329.3. M. P., 48-51°C. Boiling Range, decomposes. Sp. Gr., @ 51°C., 0.874. Flash Point, 220°F. Color and form, light tan colored solid. Odor, slight amine. Very soluble in methyl. alcohol, ethyl ether, benzene, naphtha, ethyl acetate, and hot water. Soluble in cold water. Example of one of the soaps which can readily be made from monoethylamine and an organic acid. Sharples Chemicals, Inc.

MONOGLYCOLLIN (Glyceryl Monoglycollate)

Empirical formula, $C_5H_{10}O_5$. Mol. Wt., 150. Consistency, viscous liquid. Color, pale yellow. Sp. Gr., 1.34 @ 25°C. Free acidity, 1-2%. pH (5% solution), 2.7. Sap. Val., 370. Volatility, 0.61% (4 hrs. @ 105°C.). Miscible with water, alcohol, and acetone. Immiscible with hydrocarbons. Hygroscopic. Suggested uses, excellent solvent for water soluble dyes for the manufacture of writing inks, water soluble paints, etc. Substitute for glycerine where hygroscopicity is an important factor. Glyco Products Co., Inc.

BETA NAPHTHOQUINOLINE

$C_{13}H_9N$. Mol. Wt., 179.2. White platelets. M. P., 91-3°C. Insoluble in water. Soluble in dilute acids. Extremely soluble in alcohol, benzene, and ether. Used in determination of cadmium. Organic Products Co.

NEMTAN

Auxiliary synthetic tanning agent based on a water soluble phenolic resin. Used in all types of tannages and retannages. Produces cleaner and more plump leather. Excellent for filling flanks and bellies. Decreases tanning time. American Resinous Chemicals Corporation.

NEVILLE RESIN LX-426

A modified coumarone-indene resin which is compatible with paraffin wax, of both crystalline and amorphous nature, which are normally immiscible and incompatible with regular coumarone-indene resins. Its compatibilities are in general similar to those of the regular coumarone resins. Average properties are: M. P., (cube in mercury), 68°C. Color (Neville method), 1½. Solubility maximum @ 25°C., 20 g per 100 ml Benzol. Acid no. maximum, 2.0. Saponification no. maximum, 5.0. This resin is only partly soluble in all of the commonly used industrial solvents, and special means are required to dissolve it. The resin is especially developed for various hot melt adhesive and coating applications, in conjunction with paraffin wax. The function of the latter is to plasticize the resin without excessive tack production, yielding a ductile, cohesive material having excellent adhesion to porous surfaces. The Neville Co.

Neville Resin LX-426 (Cont'd)

monly used industrial solvents, and special means are required to dissolve it. The resin is especially developed for various hot melt adhesive and coating applications, in conjunction with paraffin wax. The function of the latter is to plasticize the resin without excessive tack production, yielding a ductile, cohesive material having excellent adhesion to porous surfaces. The Neville Co.

NEVILLE RESIN LX-435

A modified coumarone-indene resin which is compatible with paraffin wax, of both crystalline and amorphous nature, which are normally immiscible and incompatible with regular coumarone-indene resins. Its compatibilities are in general similar to those of the regular coumarone resins. Average properties are: M. P. (cube in mercury), 90°C. Color (Neville method), 1½. Solubility maximum @ 25°C., 20g per 100 ml Benzol. Acid no. maximum, 2.0. Saponification no. maximum, 5.0. This resin is only partly soluble in all of the commonly used industrial solvents, and special means are required to dissolve it. The resin is especially developed for various hot melt adhesive and coating applications, in conjunction with paraffin wax. The function of the latter is to plasticize the resin without excessive tack production, yielding a ductile, cohesive material having excellent adhesion to porous surfaces. The Neville Co.

NEVILLE RESIN LX-441

A modified coumarone-indene resin which is compatible with paraffin wax, of both crystalline and amorphous nature, which are normally immiscible and incompatible with regular coumarone-indene resins. Its compatibilities are in general similar to those of the regular coumarone resins. Average properties are: M.P., (Cube in Mercury), 70°C. Color, (Neville Method), pale, opaque solid. Solubility maximum @ 25°C., 20g. per 100 ml. Benzol. Acid no. maximum, 2.0. Saponification no. maximum, 5.0. This resin is only partly soluble in all of the commonly used industrial solvents, and special means are required to dissolve it. The resin is especially developed for various hot melt adhesive and coating applications, in conjunction with paraffin wax. The function of the latter is to plasticize the resin without excessive tack production, yielding a ductile, cohesive material having excellent adhesion to porous surfaces. The Neville Co.

NEVSOL

Nevsol is a hydrocarbon solvent, high in aromatics, which is finding favor in commercial application by industrial users as an important Toluol substitute. Specifications: A.P.I. Gravity, 39-41°C. Sp. Gr., @ 15.6°/15.6°C., .820-.830. Pounds per gal., 6.91-6.83. Kauri-Butanol Value, 75-78 (Benzol = 100). Nitrocellulose Dilution Ratio, 2.4-2.6 (Toluol = 2.9). Corrosion, (Copper Dish Method), negative. Color, water-white. Distillation Range, 80.6°C. to 137.8°C. Initial B.P., 80.6°-83.3°C. Final B.P., 132.2°C-137.8°C. This solvent, like our Tollac Solvent, is produced in accordance with the specifications of United States Patent #2,229,328. The nitrocellulose tolerance of Nevsol is within 80% that of Toluol. Hence, it may be used with but slight change in formulation as an effective substitute for Toluol. In some instances, it may be found that the slightly more rapid initial evaporation of Nevsol will necessitate the use of small additional amounts of butyl or amyl alcohols to present formulations calling for Aromatic Petroleum Naphtha, Type I. For usual formulations in which these aromatic petroleum naphthas are used, no changes whatsoever are required, and the faster evaporation of the Nevsol will make for more rapid drying of the resultant lacquer and for increased production. The Neville Co.

NEVTEX 10

A modified coumarone-indene resin of the plasticizing type which imparts flexibility to compounds in which it is used, especially in the field of textile proofing, down to about —45°F. Average specifications are: Color (Neville Method), 2½. Acid No. maximum, 1.0. Viscosity @ 25°C., 500 cp. Ash % wt., maximum, 0.1. Sp. Gr. @ 38/15.5°C., 0.990. Pounds per gal. @ 38/15.5°C., 8.2. Nevtex 10 Resin is a neu-

any of these products we suggest the use of coupon on page 573.

Nevtex 10 (Cont'd)

tral, non-saponifiable, water-resistant, weather-resistant resin which is compatible with hydrocarbon polymers, chlorinated materials, such as diphenyl phenol, and waxes, coumarone-indene resins; soluble in all hydrocarbons, esters, ketones, and chlorinated solvents; insoluble in water, alcohols (below Butanol) and polyglycols. Miscible with amorphous and crystalline waxes. The Neville Co.

NEVTEX 90

A phenolic modification of coumarone-indene polymers of the plasticizing type which imparts flexibility to compounds in which it is used, especially in the field of textile proofing, down to about —45°F. Average specifications are: Color, (Neville Method), 1½. Viscosity @ 25°C., 15,000 cp. Acid No. maximum, 2.5. Ash % Weight maximum, 0.1%. Sp. Gr. @ 38/15.5, 1.090. Lbs. per gal. @ 38/15.5, 9.0. Insoluble in water. Nevtex 90 resin is a neutral water-resistant, weather-resistant, resin which has a wide range of usefulness with many different types of commercial materials. It is compatible with hydrocarbon polymers, petroleum waxes, chlorinated materials such as diphenyl, phenol, and paraffin wax, coumarone-indene resin, cellulose ethers, nitrocellulose, vinyl polymers, polyvinylaldehyde resins, alkyd resins, and many other materials. It possesses the unusual property of solubilizing the above materials and others with products with which the former are normally incompatible. Nevtex 90 is soluble in all hydrocarbons, esters, ketones, chlorinated solvents, alcohols and polyglycols. The Neville Co.

o-NITRODIPHENYL, Technical

Empirical formula, $C_{12}H_9NO_2$. Mol. Wt., 199. Crystallizing Pt., 34.5°C., min. Appearance, light yellow to reddish crystalline solid. Suggested uses: intermediate in chemical synthesis. May be partially reduced and rearranged to give 2,2′-diphenyl benzidine (NH_2 = 1). Is useful in some applications as an alternate for substituted nitrobenzenes. Available in commercial quantities. Monsanto Chemical Co.

NONAETHYLENE GLYCOL DIRICINOLEATE (S531)

Empirical formula, $C_{54}H_{102}O_{14}$. Mol. Wt., 974.9. Consistency, liquid. Color, amber. Dispersible in water. pH (5% dispersion), 4.2. Soluble in ethanol, acetone, ethyl acetate, toluene. Insoluble in naphtha, mineral oil. Suggested uses, emulsifier, coupling solvent. Glyco Products Co., Inc.

NONAETHYLENE GLYCOL DISTEARATE (S542)

Empirical formula, $C_{54}H_{106}O_{12}$. Mol. Wt., 946.9. Consistency, soft, wax-like solid. Color, cream. M. P., 29-31°C. Soluble in ethanol, acetone, ethyl acetate, toluene, hot naphtha, hot mineral oil. Insoluble in water, has some dispersibility. Uses, assistant emulsifier. Glyco Products Co., Inc.

NONAETHYLENE GLYCOL HEXARICINOLEATE (S556)

Empirical formula, $C_{126}H_{230}O_{22}$. Mol. Wt., 2096.7. Consistency, liquid. Color, amber. Dispersible in water. pH (5% dispersion), 4.95. Soluble in ethyl acetate, isopropanol, acetone, toluene, naphtha, oils. Insoluble in ethanol. Suggested uses, emulsifying agent for water in oil emulsions. Glyco Products Co., Inc.

NONAETHYLENE GLYCOL MONORICINOLEATE (S534)

Empirical formula, $C_{36}H_{70}O_{12}$. Mol. Wt., 694.5 Consistency, liquid. Color, amber. Dispersible in water. pH (5% dispersion), 4.05. Soluble in ethanol, acetone, ethyl acetate, toluene. Insoluble in naphtha, mineral oil. Suggested uses, soapless emulsifier, wetting agent. Glyco Products Co., Inc.

NONAETHYLENE GLYCOL MONOSTEARATE (S541)

Empirical formula, $C_{36}H_{72}O_{11}$. Mol. Wt., 680.5. Consistency, soft wax-like solid. Color, cream. M. P., 27-29°C. Disperses in water (hot). pH (5% dispersion), 3.35 @ 25°C. Soluble in alcohol, acetone, ethyl acetate, toluene, hot naphtha. Suggested uses, emulsifying agent, thickener. Glyco Products Co., Inc.

NON-IONIC LD

10% active concentration of a fatty hydrophillic water dispersible colloid. Opalescent dispersion with a faint pleasant odor. Excellent dispersion in water. 1% dispersion has a pH of 7.5 and a surface tension of 29.8 dynes/cm. Wetting time of a 0.1% active ingredient was 13 seconds. (Draves test). Uses, excellent non-ionic wetting, dispersing and detergent agent for cosmetics and pharmaceuticals. Stabilizes acid cosmetic creams. U. S. Patent Pending. The Emulsol Corp.

NON-IONIC LG

Edible grade and highly purified fatty hydrophillic colloid. White crystalline or white solid hard wax. Odorless. Disperses easily in warm water and remains as an opalescent dispersion on cooling. A 1% dispersion has a pH of 7.0 and a surface tension of 27.5 dynes/cm. Wetting time of a 0.1% concentration 45 seconds, (Draves test). Free fatty acid expressed as oleic acid 0.1% to 0.2%. (Contains no soap.) Uses, edible non-ionic wetting and emulsifying agent for pharmaceuticals, food and cosmetic emulsions. Detergent. Toxicity, non-toxic. The Emulsol Corp.

NUROZ

Pale wood rosin grade N to WG. Acid Value, 158. M.P., cap. tube, 78°C. A chemically polymerized rosin containing dihydro and dehydro rosin acids. Replaces all regular rosins in synthetic resins, soaps, ink vehicles, etc. where greater hardness and higher melting point is desired. This improved rosin shows decreased oxidation characteristics and will not crystallize from petroleum solvents or alcohol. Newport Industries, Inc.

NYLON WIRE INSULATION

Nylon insulation is adaptable to a wide variety of types and sizes of wire used by the electrical industry. This insulation has outstanding abrasion resistance, flexibility at low temperatures and heat stability. Nylon is applied to the wire by solution coating to give extremely thin films, as in the case of magnet wire, or by a patented high temperature extrusion process for the application of a wide range of thicker films on other types of wire. Nylon insulation is available on allocation only. E. I. du Pont de Nemours & Company, (Inc.).

PAPER RESIN 605

A new melamine type resin which not only modifies paper so that it is strong even after prolonged soaking in water, but also substantially increases the folding endurance, bursting and tensile strength of the dry paper. The many desirable uses of a wet strength paper are obvious, but heretofore it has been necessary to apply resin treatment by impregnation of the pre-formed papers rather than to the pulp slurry. The impregnation treatment has been necessary due to the fact that the resins were washed away with the dilution water during the paper-making process The new resin possesses an affinity for the fibers and therefore is added to the pulp while in preparation. The treated pulp is then formed into a sheet in the usual way with no variation in the regular procedure. No changes in or addition to the normal paper-making machinery are necessary for producing the improved paper other than that required for preparing and handling the resin solution. This will be of special interest to mills not equipped to make surface applications of chemicals to their paper products. American Cyanamid & Chemical Corp.

PARA ANISIDINE

C_7H_9ON. Mol. Wt., 123.08. Colorless crystals. B. P., 243.0°C. @ 760 mms., 89.2°C @ 10 mms. M. P., 59.0°C. Sp. Gr., 1.090 @ 20°/4°., Uses, intermediate for dye and synthetic organic chemicals. Heyden Chemical Corp.

Para Anisidine (Cont'd)

PARA NITRO ANISOLE

$C_7H_7O_3N$. Mol. Wt., 153.06. White crystals. B. P., 260.0°C @ 760 mms., 100.5°C. @ 10 mms. M. P., 54.0°C. Sp. Gr., 1.233 @ 20°/4°. Uses, intermediate for dye and synthetic organic chemicals. Heyden Chemical Corp.

PARA TOLUIDINE

C_7H_9N. Mol. Wt., 107.15. Yellow crystalline mass. B. P., 200.3°C. @ 760 mms., 86.5°C. @ 10 mms. M. P., 43.5°C. Sp. Gr., 1.046 @ 20°/4°. Uses, intermediate for dyes, plasticizers, rubber excelerators, and other synthetic organic chemicals. Heyden Chemical Corp.

P. A. W. TAPE

Made from fabric coated with synthetic elastic for sealing metal joints and seams. For war work only. E. I. du Pont de Nemours and Company, Inc.

PENSAL-B

A powerful laundry detergent which can safely be used on all classifications; family work, wet wash, colored work, overalls, wiping rags, etc. Pensal-B is a carefully compounded mixture of buffered alkalies and a high grade hydrophilic colloid, augmented by efficient wetting agents. Pennsylvania Salt Mfg. Co.

PENTACHLOROPROPANE, SOLID

Empirical formula, $C_3H_3Cl_5$. Mol. Wt., 216.5. M. P., about 178°C. Soluble in organic solvents; insoluble in water. Suggested uses, as an insect repellant and plasticizer. Pennsylvania Salt Mfg. Co.

PENTACIZER 152

A liquid plasticizer consisting mainly of the triacetate-tripropionate ester of dipentaerythritol. Lowest boiling fraction 173-180°C. at 2 mm. Compatible with many resins including cellulose derivatives. Sp. Gr. at 25°C., 1.123. Viscosity at 25°C., 450 centipoises. Ref. Index at 25°C., 1.4524. Water solubility, 0.006% at 25°C. Toluene Dilution Ratio, 11. Heyden Chemical Corporation.

PENTACIZER 176

A liquid plasticizer consisting of acetate-propionate esters of PENTEK (technical pentaerythritol). Lowest boiling fraction 173-180°C. at 2 mm. Compatible with resins and plastic materials, particularly cellulose acetate and vinyl resins, for both of which it is an excellent plasticizer. Ref. Index at 25°C., 1.4449. Sp. Gr. at 25°C., 1.119. Viscosity at 25°C., 64 centipoises. Water solubility at 25°C., 0.002%. Toluene Dilution Ratio, 7.5. Heyden Chemical Corporation.

PENTACIZER 226

A plasticizer consisting of propionate esters of PENTEK (technical pentaerythritol). Compatible with most resins and cellulose derivatives. Melting Range, 25-30°C. Water solubility, 0.002% at 25°C. Toluene Dilution Ratio, 15. Possesses excellent stability against water. Heyden Chemical Corporation.

PENTAERYTHRITOL TRILEVULINATE (S609)

Empirical formula, $C_{20}H_{30}O_{10}$. Mol. Wt., 430.15. Poorly soluble in water. Soluble in ethanol, acetone, ethyl acetate, toluene. Insoluble in naphtha. Compatible with cellulose acetate. Suggested uses, plasticizer. Glyco Products Co., Inc.

For your convenience in asking for more detailed information on

PENTAWAX 217

A pentaerythritol stearate modified to give it properties similar to carnauba wax. Can be mixed with carnauba to give self-polishing waxes. Softening point of 63°C. and flow point of 65°C. Compatible with all natural waxes as well as with vegetable and mineral oils. Insoluble in water and organic solvents hot or cold other than hydrocarbon solvents, in which it is soluble at room temperature. Acid Number, below 5. Sp. Gr. at 25°C., 1.05. Heyden Chemical Corp.

PENTAWAX 218

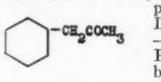
A pentaerythritol stearate modified to give it properties similar to beeswax. Softening point of 54°C. and flow point of 63°C. Compatible with all natural waxes as well as with vegetable and mineral oils. Soluble in hydrocarbon solvents at room temperature and insoluble in water. Soluble in hot organic solvents. Shrinkage on freezing is negligible. Acid number can be varied from 5 to 50 as desired. Heyden Chemical Corp.

PENTAWAX 242
(Technical dipentaerythritol hexa stearate)

A water insoluble wax having a flow point of 75°C. When blended with an equal weight of mineral oil, the mixture is a homogeneous firm solid. It is compatible with all the common natural waxes and is soluble in both vegetable and mineral oils. It is non-irritating to the human skin. Heyden Chemical Corp.

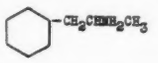
PHENYL ACETONE

Synonyms: Benzyl methyl ketone 1-Phenyl-2-propanone. Mol. Wt., 134.17. Density, 1.019. M. P., °C., —15.4. B. P., °C., 216.7. Phenyl Acetone promises to become a valuable pharmaceutical intermediate. Its active ketone group indicates that it may take part in condensations, aminations, reductions and other reactions characteristic of ketones. Commercial Solvents Corp.



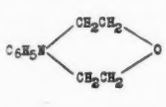
beta-PHENYL ISOPROPYLAMINE

Synonyms: 1-Phenyl-2-aminopropane, 2-Phenyl isopropylamine. Mol. Wt., 135.20. Density, 0.928-0.939. B. P. °C., 204-205. Refractive Index, 1.519. Solubility in water, g/100 ml, 2. beta-Phenyl isopropylamine offers many possibilities in the synthesis of pharmaceutical products. Its active amino group indicates that salts of this compound may be readily formed; it will undergo condensation reactions; and it will form substituted amides with acids, anhydrides, acyl halides and esters. Commercial Solvents Corp.



n-PHENYL MORPHOLINE

Mol. Wt., 163.11. One per cent soluble in water at 20°C. Melts at 52-56°C. and boils at 265-268°C. Vapor Pressure is less than 0.1 mm. at 20°C. White solid. Uses, a chemical intermediate in the manufacture of dyestuffs, rubber accelerators, corrosion inhibitors, and photographic developers. Available only in research quantities. Carbide and Carbon Chemicals Corporation.



PITMONE

A new material for quick simple colorimetric test for pregnancy. Rare Chemicals Research.

PLASTIC "CAVALON"

Synthetic resin coated upholstery fabric. For war work only. E. I. du Pont de Nemours and Company, Inc.

PLASTIC SULFUR

Melting Point, indefinite. Solubility, min. 55% insoluble in carbon bisulfide. Appearance, greenish yellow. Suggested uses, as a compounding ingredient in rubber. Available in commercial quantities. Monsanto Chemical Co.

POLYETHYLENE GLYCOL 200, 300 400

$HO(CH_2CH_2O)_xH$. Mixtures of various higher glycols which are rather viscous, light-colored, hygroscopic liquids. They absorb less moisture when exposed to the atmosphere than the simpler glycols. Polyethylene Glycol 200 is predominantly tetraethylene glycol, and has an average molecular weight of approximately 200; Polyethylene Glycol 300 is predominantly hexaethylene glycol with molecular weight of approximately 300; and polyethylene Glycol 400 is predominantly nonaethylene glycol with a molecular weight of approximately 400. However, the material as supplied in each case contains higher and lower glycols. They are completely soluble in water and many organic solvents, but are insoluble in aliphatic hydrocarbons. Polyethylene Glycols 300 and 400 are soluble in the aromatic hydrocarbons: benzene and toluene. Uses, solvents for nitrocellulose, a property which would be expected from the combination of alcohol and ether groups. Plasticizers for casein and gelatin compositions, glues, cork, polyvinyl alcohol, and special printing inks where advantage can be taken of their low vapor pressures and decreased hygroscopicities. The two alcohol groups present in the molecule can be esterified with dibasic acids to form resins of the alkyd type which possess different and unusual properties. Products resulting from esterification with one mole of fatty acids show interesting surface active properties. Carbide and Carbon Chemicals Corporation.

POLYVINYL ACETATE

$(CH_2CHOOCCH_3)_x$. Density 1.19. Refractive Index 1.47. Cube melting point 125-270. Transparent, thermoplastic solid soluble in esters, ketones, alcohols, acids, chlorinated and aromatic hydrocarbons; insoluble in water, mineral and vegetable oils and fats, glycerin; water emulsions are stable. May be hydrolyzed to polyvinyl alcohol. Uses, heat-sealing and solvent-activated adhesives, latex extender and substitute, binder for paper pulp and scrap leather, ingredient in textile sizing and finishing compositions and in compositions for molding rubber-like articles. Commercially available in bead, solution and emulsion forms. E. I. du Pont de Nemours & Company, (Inc.).

POLYVINYL ALCOHOL

$(CH_2CHOH)_x$, linear polymer of high molecular weight. Density 1.27-1.30. Darkens at 160°C. and decomposes above 200°C. without melting. White to cream solid powders soluble in water, insoluble in common organic solvents. Uses, adhesive, emulsifying agent, size for textiles, paper, leather, fabrics where grease resistance is desired. Transparent, grease-proof films made from water solutions. Plasticized solid molded to grease and solvent-proof articles with rubber-like properties. Commercially available in low, medium and high viscosity grades. E. I. du Pont de Nemours & Company, (Inc.).

POTASSIUM BISACCHARATE
(Cream of Saccharate)

COOH-(CHOH)4-COOK. Mol. Wt., 248. Slightly soluble in cold water, soluble in water of 90C., 15 gm./100ml. Acidity: ml. n. NaOH/gm., 4.02. Odor, none. Color, white powder. Suggested use, substitute for cream of tartar, especially in baking powders and effervescent salts. Available in any quantities. Brocker Chemical Co.

POTASSIUM CYANIDE (Domestic)

KCN. A white granular product of high purity (96%) and uniformity. Uses, in silver plating, makes possible dense, smooth deposits; heavy fine-grained adherent coatings at high current densities; other material operating advantages. Also useful in gold and copper plating; heat treatment of steel (nitriding);

Potassium Cyanide (Cont'd)

chemical reagent. Made in the U. S. A. Available in commercial quantities. E. I. du Pont de Nemours & Company (Inc.).

POTASSIUM-SODIUM SACCHARATE

COONa-(CHOH)4-COOK. Mol. Wt., 270. Freely soluble in cold and hot water. Odor, none. Color, amber colored syrup. Suggested use, substitute for rochelle salt. Availability, in any quantities. Brocker Chemical Co.

POTASSIUM STANNATE
(Technical grade)

Formula, $K_2SnO_3 \cdot 3H_2O$. Mol. Wt., 298.94. Solubility, approximately one hundred parts in one hundred parts of water at room temperature and increases in solubility with increased temperature. Uses, source of tin in alkaline tin plating baths. No special shipping regulations required. Metal & Thermit Corporation.

PRE-DOPED AIRPLANE TAPE

Nitrocellulose coated fabric for sealing joints and seams on fabric covered airplane and glider wings and fuselages. For war work only. E. I. du Pont de Nemours and Company, Inc.

PURE SULFUR

Pure sulfur free of inorganic and organic matter. Acidity none. It can be kept at 600°C. in a sealed tube for 8 hours without discoloration or formation of hydrogen sulfide. The molten sulfur supercools readily. The viscosity of the molten sulfur is independent of previous heat treatment of the sulfur. The viscosity heating and cooling curves are practically identical. Texas Gulf Sulphur Co., Inc.

PX CLOTH

Pyroxylin impregnated book cloth. For civilian use. E. I. du Pont de Nemours and Company, Inc.

QUININE-BISMUTH-IODIDE

$C_{20}H_{24}O_2N_2HI\text{-}BiI_3$. Composed of 1 mol. each of bismuth triiodide and quinine hydriodide. Red powder. Insoluble in water and most organic solvents. Uses, in pharmacy to obtain systemic effect of quinine and bismuth in syphilis. Organic Products Co.

RAYON TOW

Rayon Tow is a collection of several thousands of continuous viscose rayon filaments having the general appearance of untwisted rope. The diameter of each filament, and the number of filaments making up the tow, are accurately controlled. This product should not be confused with rayon staple fiber (short lengths) nor with regular continuous filament rayon. Uses, Rayon Tow today bids fair to simplify a number of textile practices. It is also finding application in a variety of uses for other American industries where hemp and flax have hitherto been the only available fibers. E. I. du Pont de Nemours & Company (Inc.).

RED PRUSSIATE OF POTASH
(Potassium Ferricyanide)

$K_3Fe(CN)6$. Over 99% pure. Bright red granules. Uses, photographic reducing solutions, etching solutions, re-silvering of mirrors, photographic toning. In general, red prussiate of potash can be used in any application where an alkali metal ferricyanide is important, i. e., blue print paper, color film developing, etc. American Cyanamid & Chemical Corp.

REFINED WAX #648A

M. P., 174-176°F. Acid No., 15-17. Sap. No., 70-73. Flash Point, 500-505°F. ISCO REFINED WAX #648A is being used in the carbon paper industry to advantage replacing Carnauba Wax. Innis, Speiden & Co.

any of these products we suggest the use of coupon on page 573.

REFINED WAX #693

M. P., 175°F. Excellent for one time carbon papers. Innis, Speiden & Co.

RESINOX 6905

Composed of a phenol formaldehyde resin and a chopped cotton cord filler. It is designed especially for the molding of articles requiring high impact strength and a high degree of moldability. Impact strength will range from 7.0 to 7.5 ft.-lbs./inch of notch as compared to 0.28 to 0.32 ft.-lbs./inch of notch for a wood flour filled product. Resinox 6905 is finding numerous applications in the war effort for structural uses. Available on high priority for military and essential civilian uses. Monsanto Chemical Co.

RESINOX 7013

Resinox 7013 is a special molding material for electrical insulation purposes. It is a combination of phenol-formaldehyde resin and mica. By properly processing these two principal components, a molding composition having excellent dielectric strength and low power factor is obtained. The principal application is in the manufacture of coil forms, condensers, tube bases and various other electrical parts used in high frequency communication systems. Available on high priority for military and essential civilian uses. Monsanto Chemical Co.

RESIN SOLUTION 58-18

Vinyl type. Final film not tacky but possesses tack during drying and good adhesion afterward. Aromatics and ketones may be used as diluents. American Resinous Chemicals Corporation.

RESIN SOLUTION 58-32 A

Synthetic resin composition. Forms good flexible, water and grease resistant films. Used for paper and cloth coatings. Available also in emulsion form. American Resinous Chemicals Corporation.

RESIN SOLUTION 63-25

Acrylic type. Good permanent tack and fair strength. Both aromatic and alifatic may be employed as solvents. Used in making adhesive tapes as complete replacement for rubber cement. High solids content. American Resinous Chemicals Corporation.

RUBBER EXTENDER 58-21 A

Long oil alkyd. Alifatic solvents used as diluents. Excellent tack but little strength. Used as extender for rubber cements. American Resinous Chemicals Corporation.

SAFLEX TS

Properties of a representative compound of Saflex TS as used for army raincoats: Sp. Gr., 1.165 @ 25°/25°. Tensile strength @ 25°C., 50% R. H., 1700 lbs./sq. in. % elongation at break @ 25°C., 50% R. H., 500%. % water absorption, 48 hrs. @ 25°C., 3.3%. Water diffusion, 0.09 fl. oz./sq. ft./day @ 25°C. Tackiness, non-tacky @ 180°F. Flexibility, stiff but does not crack when sharply flexed @ —40°F. Age resistance, 7 days in oxygen bomb @ 158°F. has no effect; 200 hrs. accelerated aging (Kline test) has no effect. Methods of processing: can be handled on mills, spreading, and calendering equipment much the same as rubber. In general, thinner coatings are used than is the case with rubber. Suggested uses, Saflex TS is the plasticized, heat curing polyvinyl butyral used for coating fabrics for army raincoats, hospital sheeting, water bags, marine ponchos and similar articles. Available only for applications for the armed forces and lend-lease. Monsanto Chemical Co.

SANTOMERSE OS

Organic amine salt of dodecyl benzene sulfonic acid. Suggested uses, as oil-soluble wetting agent in preparing emulsions, grinding pigments, making inks. Available in sample quantities. Monsanto Chemical Co.

SANTOMERSE 43

Organic amine salt of dodecyl benzene sulfonic acid. Suggested uses, as oil-soluble wetting agent in preparing emulsions, grinding pigments, making inks. Available in sample quantities. Monsanto Chemical Co.

SANTOMERSE 43-P

Organic amine salt of dodecyl benzene phosphinic acid. Suggested uses, as an oil-soluble wetting agent in preparing emulsions, grinding pigments, making inks. Available in sample quantities. Monsanto Chemical Co.

SANTOMERSE 83

Organic amine salt of dodecyl benzene sulfonic acid. Suggested uses, as an oil-soluble wetting agent in preparing emulsions, grinding pigments, making inks. Available in sample quantities. Monsanto Chemical Co.

SANTOWAX DF

Solid organic material. Flash Pt., 440°F. Fire Pt., 460°F. Softening Pt., 128-129.7°C. Crystallizing Pt., 125-126°C. Density, 0.99 at 28.6°C. Refractive Index, 153. Decomposition Pt., 400-420°F. Suggested uses, in polishes, wax finishes, paints, cosmetics, paper, as an opacifier, as a sealing compound. Available in sample quantities. Monsanto Chemical Co.

SANTOWAX OSA

Solid organic material. Flash Pt., 475°F. Fire Pt., 535°F. Softening Pt., 59-59.2°C. Crystallizing Pt., 50-52.5°C. Density, 0.99 at 29.5°C. Decomposition Pt., 450°F. Suggested uses, in polishes, wax finishes, paints, cosmetics, paper, as an opacifier, as a sealing compound. Available in sample quantities. Monsanto Chemical Co.

SANTOWAX PSA

Solid organic material. Flash Pt., 515°F. Fire Pt., 605°F. Softening Pt., 139.2-139.5°C. Crystallizing Pt., 135.5-136°C. Density, 104 at 28.9°C. Refractive Index, 158. Decomposition Pt., 380-400°F. Suggested uses, in polishes, wax finishes, paints, cosmetics, paper, as an opacifier, as a sealing compound. Available in sample quantities. Monsanto Chemical Co.

SHELLAC EXTENDER 55-43

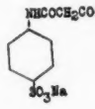
Extender for shellac for specialized purposes. Used for impregnation and stiffening of felts or wool hat bodies for the hat industry. Serves to extend shellac threefold. 70% of 55-43 solids and 30% of shellac solids may be used without clogging of buffing papers. American Resinous Chemicals Corporation.

SHELLAC SUBSTITUTE 87-17

Complete replacement for alcohol shellac solutions for coating leather, wood, metals, paper. Available with different degrees of flexibility, drying speed, and after tack. American Resinous Chemicals Corporation.

SODIUM ACETOACETYL-p-SULFANILATE

Supplied as a red-colored aqueous solution containing 40 to 50 per cent of the salt. Uses, the reactive acetoacetyl group readily combines with diazotized aromatic amines. The sulfonate group, capable of forming alkali metal salts, increases the water solubility of this compound and its derivatives. Carbide and Carbon Chemicals Corporation.



SODIUM CACODYLATE

$Na(CH_3)_2AsO_2.3H_2O$. Mol. Wt., 214.0. White deliquescent crystals free from odor. Used medicinally in treatment of various human and animal disorders. Edcan Laboratories.

SODIUM CHLOROSULFONATE

$NaClSO_3$. Mol. Wt., 138.5. Finely divided white crystalline powder. Melting Point, 200-230°C. (with decomposition). Soluble in water and alcohol with decomposition, insoluble in non-hydroxylic organic solvents. Chemical properties: hydrolyzed by moisture forming sodium bisulfate and hydrogen chloride; reacts with alcohols forming sodium alkyl sulfates and hydrogen chloride, with carboxylic acids forming acid chlorides, with amines forming substituted sulfamates, with unsaturated hydrocarbons to form chloro-substituted sodium sulfonates. Suggested uses, manufacture of sodium alkyl sulfates and chloro-substituted alkyl sodium sulfonates by reaction with alcohols and unsaturated hydrocarbons respectively. This material is available in small quantities for experimental evaluation. E. I. du Pont de Nemours & Company, (Inc.).

SODIUM METHYL SULFATE (50% Aqueous Solution)

CH_3SO_4Na. Mol. Wt., 134.1. Density of 50% aqueous solution, 1.355. Odor, slightly pungent. Color, colorless. Chemical properties: stable to hydrolysis in neutral or alkaline solution, hydrolysed in acid solutions to methyl alcohol and sulfuric acid. The compound is a methylating agent in alkaline solution. Suggested uses, in methylating operations where convenient physical form, high solubility, and lack of volatility are desirable. This material is available only in small quantities for experimental investigation. E. I. du Pont de Nemours & Company, (Inc.).

SODIUM PERBORATE MONOHYDRATE

$NaBO_3.H_2O$. Active oxygen 15%, stable at ordinary temperatures, compatible with a wide range of materials for pharmaceutical compounding, and possessing a higher active oxygen content than sodium perborate tetrahydrate. Slight hygroscopic tendency. Available in limited commercial quantities. E. I. du Pont de Nemours & Company, (Inc.).

SODIUM PERCARBONATE

$2Na_2CO_3.3H_2O_2$. Active oxygen 15%. Mol. Wt., 314. Water solubility 25-30 grams per 100 cc. at 30°C. Dissolves with negative heat of solution. pH of water solution 10-10.2. Good stability at room temperatures up to 110°C. and in high humidity. Suggested uses, pharmaceutical, food industry, specialized industrial applications. Available only in small quantities for experimental investigation. E. I. du Pont de Nemours & Company, (Inc.).

SOLVIT A

An edible fatty acid ester of polyhydroxy carboxylic acids. Amber colored, clear, viscous liquid with acetic acid odor. Excellent dispersion in water. 1% dispersion has a pH of 3.7 and a surface tension of 34.8 dynes/cm. Acidity expressed as acetic acid 4.3%; specific gravity 0.96. (Contains no soap.) Uses, edible emulsifier for food and pharmaceutical emul

(Continued on Page 606)

For your convenience in asking for more information on these products use coupon on page 573.

HELPING THE CHEMICAL BUYER

"Take the Hurdles"

With many "staples" off the market and other chemicals increasingly hard to get, this is a mighty good time to look to a supply source where experience, plus initiative and resourcefulness can help you "take" the buying hurdles.

Here at ISCO, when the product you want is not to be had, we try to suggest a dependable substitute, if one is available.

Such substitutes are recommended only with knowledge of how well they may be expected to carry on for the absentee. Some have been developed in the ISCO Laboratories. All have been tested for merit.

ALSO

ISCO

CAUSTIC POTASH
CARBONATE OF POTASH
CHLORIDE OF LIME
(Bleaching Powder)
CAUSTIC SODA
FERRIC CHLORIDE

Write, wire, or phone

For example:

JAPAN WAX SUBSTITUTE, No. 525
M. P. ..... 56-57° C.

CARNAUBA WAX SUBSTITUTE, No. 580
M. P. ..... 181½-183° F.

MOLDING WAX, No. 583
M. P. ..... 76° C.

REFINED WAX, No. 648-A
M. P. ..... 176½° F.

BEESWAX SUBSTITUTE, No. 662
M. P. ..... 143-149° F.

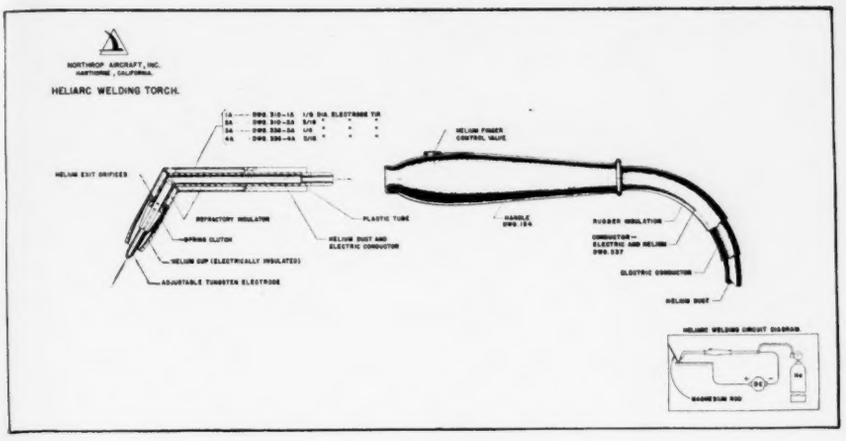
MONTAN SUBSTITUTE, No. 506
M. P. ..... 170-174° F.

Bleached MONTAN SUBSTITUTE, No. 574
M. P. ..... 160-161° F.

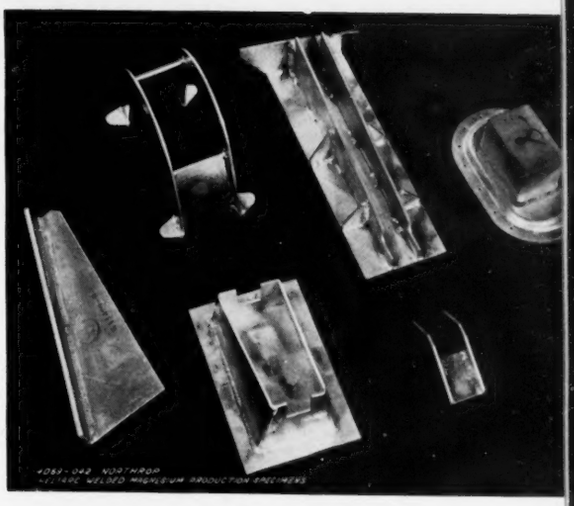
Look for these Substitutes at the Chemical Exposition

Hotel Sherman, Chicago, November 24-29th, 1942

INNIS, SPEIDEN & COMPANY *Established 1816* **117 Liberty Street, NEW YORK**
BOSTON • CHICAGO • CINCINNATI • CLEVELAND • GLOVERSVILLE, N. Y. • PHILADELPHIA



Drawing of torch used in "Heliarc" Welding



Specimens of "Heliarc" Welding

New "Heliarc" Method of Welding Makes Use of Magnesium Sheets

Culminating research over a two-year period, Northrop Aircraft, Inc., introduced recently "Heliarc" Welding, a new method of arc welding which makes possible the use of magnesium sheets, extrusions and tubing into structures simpler, lighter, and stiffer than is possible in conventional duralumin construction. At the same time, methods of treating magnesium to make it less inflammable and more resistant to heat have been perfected.

The use of magnesium welded structures eliminates the thousands of rivets in conventional planes.

Magnesium is the most abundant metal on the earth and in the ocean. The cost of magnesium alloys at the present time is greater than aluminum alloys. However, because of new magnesium plants under construction and increased production in the plants now in operation, magnesium alloys will be cheaper than aluminum alloys in a very short time.

Contrary to popular belief, magnesium alloys are not inflammable when properly processed; in fact they are more resistant to direct flames than aluminum alloys. Although magnesium alloys are 35% lighter than aluminum alloys and 21% of the weight of steel per unit volume, their weight strength ratio is comparable to aluminum alloys, and they possess the design property of stiffness and rigidity that cannot be obtained in other alloys.

Heliarc weld ingots have in general an extremely fine grain with practically no grain enlargement adjacent to the bead, indicating that there is a minimum of heating effects on the adjacent metal. This accounts for the very good weld efficiencies obtained on heliarc welded alloys.

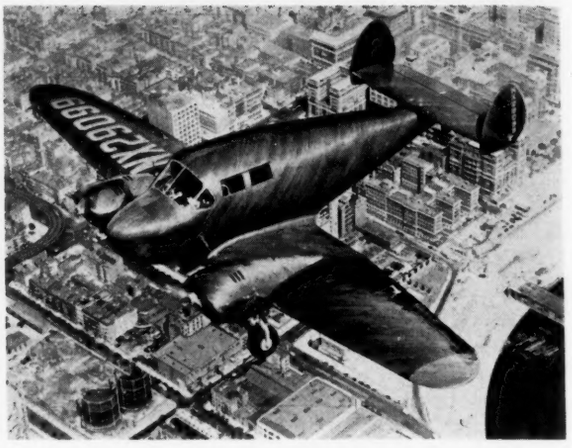
Dowmetal J-IH magnesium alloy, heliarc welded, has approximately 95% of the parent metal strength in the weld area. However, at present the design safety factor for welded dowmetal J-IH assemblies is 75% of the strength of the parent metal. These strength values are based on butt welded joints. Fillet, lap, edge, or corner welds are weaker than the butt welded joint and must be stressed accordingly.

Heliarc welding has proven to be a successful medium of attachment for magnesium, stainless steel, brass, inconel, monel, and some of the carbon steel alloys. Research work is now in progress to extend its use to aluminum and other carbon steel alloys not heretofore heliarc welded. In the heliarc welding process, a shield of helium gas envelops the molten metal. Because helium gas is an inert gas, it prevents oxidation and eliminates the use of a flux and the danger of entrapped flux in the weld ingot that would promote corrosion. The arc in this process is produced directly between a tungsten electrode and the base metal rather than between two tungsten electrodes as is the practice in atomic hydrogen welding.

Dow Chemical Co. has worked on this process in a parallel vein, and at the annual meeting of the American Welding Society this month will present the metallurgical aspects of heliarc welding.

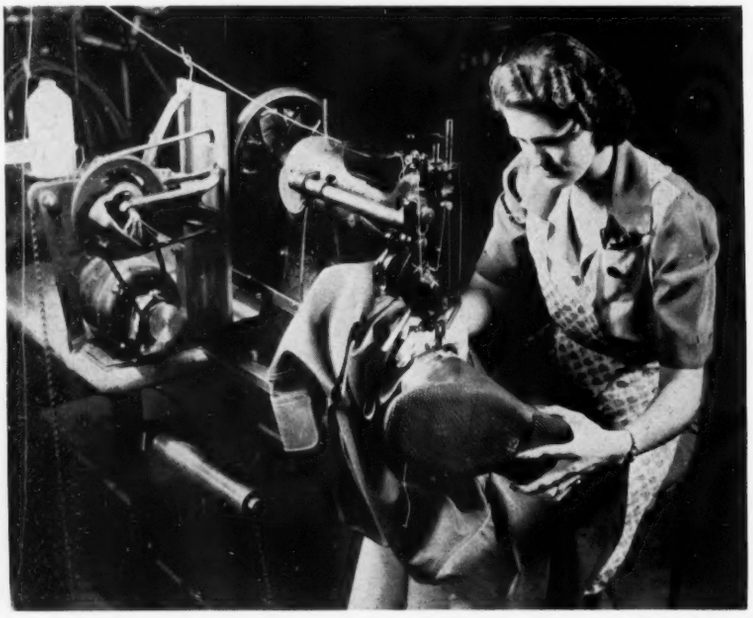
"Heliarc" welder at work

Micro-photograph of grain structure of weld, mag. 500x. Acetic acid etch shows weld fusion of weld ingot with parent metal. Weld ingot (darker half) made of Dowmetal "J" alloy rod blended with Dowmetal "J" parent metal (lighter half).



Here & There in Industry

The airplanes at the top and bottom of this column are made of molded aircraft plywood. Photos were submitted by Ault & Wiborg Corp., subsidiary of Interchemical Corp., which has just completed a report on an extensive research into plywood finishing, a big problem these days. The job at the top is molded mahogany plywood with a finish designed to meet severe tests. At the left, top, workman is cleaning the chlorine injector at a huge Baldwin Filtration Plant with a blast of compressed air. This Cleveland water supply plant keeps about 1,000 feet of compressed air lines for maintenance work. Below him, a woman worker assembles a life-saver suit at a B. F. Goodrich plant. Bottom, left, fluorescent lighting fixtures in R. & W. Wiley, Inc.'s drafting rooms use a new method of ballasting to give positive, instantaneous starting.



Sharples

MONOAMYL NAPHTHALENE

Formula $C_{10}H_7C_5H_{11}$ *Molecular Weight* 198.19

SPECIFICATIONS

Color	Amber
Specific Gravity at 20°/20°C.	0.96-0.97
Distillation:	
Initial Boiling Point	Not below 279°C.
Not less than 88%	Below 310°C.
Final Boiling Point	Not above 330°C.

OTHER PROPERTIES

Average Weight per Gallon	8.04 lbs.
Flash Point (open cup)	255°F.
Specific Gravity at 60°/15°C.	0.934
Solidification Point	–60°C. (Approx.)
Refractive Index at 20°C.	1.573
Coefficient of Expansion per deg. C.	0.00077 (Calc'd.)
Heat of Vaporization	64.3 cal./gm. (Calc'd.)
Specific Heat	0.411 cal./gm.
Viscosity at 25°C.	7.7 centipoise
Viscosity at 60°C.	2.57 centipoise
Vapor Pressures:	

Temp. °C.	*Mm. Hg.*
20	0.01
158	20
189	50
205	75
213	100
219	125
225	150
230	175

Action on Copper and Iron ..... None

Monoamyl Naphthalene is a slightly viscous, oily liquid, readily miscible with most organic solvents. Under ordinary conditions it is not affected by water, dilute acids or alkalies and it does not undergo appreciable decomposition at the normal boiling point. In the tests conducted it has been found to be non-toxic.

Suggested uses for Monoamyl Naphthalene include its application in the formulation of vehicles for certain types of inks and vitrifiable colors and as a plasticizer for a number of synthetic resins and elastic materials to impart plasticity at relatively low temperatures. It is also of interest as a coupling agent for mineral and vegetable oils and as a medium for constant temperature baths.

In addition to Monoamyl Naphthalene, Sharples also manufactures Diamyl Naphthalene, Refined Mixed Amyl Naphthalenes, Crude Mixed Amyl Naphthalenes, and Polyamyl Naphthalene. These products and many others are described in the 13th Edition of "Sharples Synthetic Organic Chemicals." If you have not received your copy, one will be mailed promptly on request.

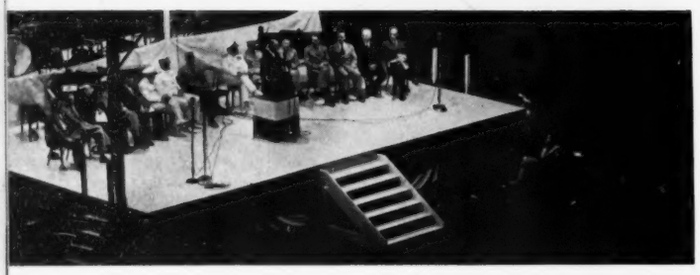
SHARPLES TRADE MARK CHEMICALS

SHARPLES CHEMICALS INC.

PHILADELPHIA · · CHICAGO · · NEW YORK

"E" for Excellence

More and more plants each month fly the Army-Navy "E" pennant, emblem of excellence in production of war materials. Each presentation reminds us of the splendid job being done by American industry. On this page are several of the recent presentations in the chemical and allied industries. Left, Eastman Kodak Co., Rochester, N. Y., held ceremonies recently at the award presentation. Top photo shows William J. Lehle, Kodak Park machinist, and Thomas J. Hargrave, president of the company, accepting the pennant from Brig. Gen. Herman W. Schull. Below that, a photo of the crowd—more than 20,000 employees strong. Bottom photo, Thomas J. Hargrave making his address at the ceremonies.



Right, on an official visit to the Foxboro Co., Foxboro, Mass., Sept. 23, Rear Admiral E. J. O'B. Croker, R.N., Chief of the British Admiralty Technical Commission, at Ottawa, congratulates Edgar H. Bristol, president, on the contribution which Foxboro men and women are making to the success of British naval operations, particularly against the U-boats. At the right, C. J. Brown, who was born in England and who for many years has been in charge of the company's production of pyrometers. At the left, Arnold Dixon, a Foxboro employee of more than 25 years, leader of the band. Below a mass meeting of employees attended the recent Army-Navy "E" Award ceremonies at the Westinghouse Micarta works in Trafford, Pa. Below, right, Buffalo Pumps, Inc., also was a recent recipient of the Army-Navy "E" Award for excellence in production. Ceremonies were held at North Tonawanda, N. Y., where the photo was taken. Left to right, Henry W. Wendt, vice-president of Buffalo Pumps, Inc., Otto V. Daum, plant manager; Rear Admiral Wat T. Cluverius, U. S. Navy, retired; and Edgar F. Wendt, president of the firm.

PRODUCTION ON THE WING!

Baker *helps you meet wartime emergencies with High Purity Chemicals—Tonnage Producing Capacity*

Throughout the nation production is soaring.

But it must move still faster. Wartime demands, in ever-increasing volume, are pouring in upon manufacturers.

Every day, chemists and production executives engaged in new fields of work are faced with new problems. Every day, their need for tonnage chemicals of exacting specifications is more urgent.

To these men, Baker offers assistance.

We, too, have enlarged our facilities and you can get tonnage chemicals of unusual purity from Baker.

We invite you to call upon Baker—and to rely upon Baker as a reliable source of supply. Baker will gladly contribute the combined knowledge of its Technical, Executive and Manufacturing Staffs to meet any wartime problem.

J. T. Baker Chemical Co., *Executive Offices and Plant*: Phillipsburg, N. J. *Branch Offices:* New York, Philadelphia and Chicago.

Baker's

INDUSTRIAL CHEMICALS

MALLINCKRODT PRODUCES STRATEGIC MERCURIALS

The *Axis* may control the rich mercury mines at *Almaden* in Spain and *Siele* in Italy, but it has failed to slow down American production of strategic mercury compounds. From mines in the Americas has come increased output to offset the loss of Europe's raw material sources and keep our war machine running in high gear.

For America's fighting forces and for our Allies, for vital war industries and for civilian industry essential to the public welfare, Mallinckrodt is producing Mercurials of the same high quality as in the past.

If you can qualify under the WPB Mercury Conservation Order and are in need of Mercurials, make Mallinckrodt your source of supply. Write today.

★ CALOMEL
★ CORROSIVE SUBLIMATE
★ MERCURY AMMONIATED
★ MERCURY BISULFATE
★ MERCURY CYANIDE
★ MERCURY IODIDE
★ MERCURY NITRATE
★ MERCURY OLEATE
★ MERCURY OXIDE
★ MERCURY SALICYLATE
★ MERCURY SUBSULFATE
★ MERCURY OINTMENT

FINE CHEMICALS Mallinckrodt SINCE 1867

MALLINCKRODT CHEMICAL WORKS

Mallinckrodt Street, St. Louis, Mo. • 74 Gold Street, New York, N. Y.
Chicago • Philadelphia • Los Angeles • Montreal

NEWS OF THE MONTH

GOVERNMENT

Trial Postponed

It's hands off those 21 chemical companies and 65 officials charged with anti-trust law violations until the war's over.

Attorney General Francis Biddle asked the U. S. District Court at South Bend, Ind., to postpone the indictment filed last June 26 because the "trial at this time would seriously impair the war effort."

The companies and their officials have been charged with illegal fixing of prices, restrictions on production, and control of distribution of various important chemicals such as formic acid, sulfuric acid, oxalic acid, chromic acid, muriatic acid, and bichromates of soda and potash.

Companies named in the indictment were: E. I. du Pont de Nemours & Co., Victor Chemical Co., General Chemical Co., Innis, Speiden & Co., American Cyanamid & Chemical Co., Monsanto Chemical Co., Dow Chemical Co., Standard Oil Co., of New Jersey, Prior Chemical Corp., Davidson Chemical Co., Atlas Powder Co., Mutual Chemical Co., Pennsylvania Salt Manufacturing Co., Southern Agricultural Chemical Corp., F. S. Royster Guano Chemical Co., Stauffer Chemical Co., New Jersey Zinc Sales Co., Oldbury Electro Chemical Co., Harshaw Chemical Co., Martin Dennis Co., and Natural Products Refining Co.

To Aid War Production Board

A committee of engineers and scientists to determine the manner in which the projected Office of Technical Development should be set up within the War Production Board, and to define the scope, functions and methods of operations which the office should have, has been appointed.

Chairman of the new committee is Webster N. Jones, Director of the College of Engineering, Carnegie Institute of Technology at Pittsburgh. Other members are: Dr. Lawrence W. Bass, Director of Research, New England Industrial Research Foundation, Boston; Dr. Oliver E. Buckley, President, Bell Telephone Laboratories, New York; Col. Clarence E. Davies, Ordnance Department, U. S. Army, Washington; Dr. Ray P. Dinsmore, Manager, Development Department, The Goodyear Tire and Rubber Co., Akron, Ohio; Admiral J. A. Furer, U. S. Navy, Washington; Dr. Jerome C. Hunsaker, head of the Departments of Mechanical and Aeronautical Engineering, Massachusetts Institute of Technology, Cambridge, Mass.; H. W. Graham, Director of Metallurgy and Research, Jones and Laughlin Steel Corp., Pittsburgh; S. D. Kirkpatrick, Editor of "Chemical and Metallurgical Engineering," New York.

Advertise in L. A.

A project to enlist the cooperation of United States business men in maintaining advertising in the Latin American Republics was announced a short time ago by Nelson A. Rockefeller, Coordinator of Inter-American Affairs.

COMPANIES

Basic for Sale?

Basic Refractories, Inc., the company which controls Basic Magnesium, Inc., is reported to be engaged in negotiations looking toward possible sale of that company's interest to Anaconda Copper Mining Co., according to information received here in New York.

New Rubber Material

Experiments started by National Dairy Products Corp. followed by the development work of B. F. Goodrich Co. have led to government sanction of a plant for making "a rubber-like substance from by-products of dairy processers."

William M. Jeffers, rubber director, announced this fact early this month but warned that the process was still in the test tube stage. Experiments carried out so far, he said, gave reason to hope that material suitable for recapping tires might eventually be developed in this manner.

Salvage Wardens at Work

Two hundred salvage wardens are patrolling the workshops of the Westinghouse Electric and Manufacturing Co., hunting out scrap and promoting full use of war-vital materials. Modeled after the civilian defense units which have been set up in every American community, the salvage warden plan will operate continuously and will extend to other plants of the company after being tested at the East Pittsburgh works.

Heil Changes Name

Heil & Co., Cleveland, manufacturers of chemical resisting equipment, has changed its name to Heil Engineering Co. No change in personnel has been made.

Record Scrap Collection

More than 3,700,000 pounds of scrap materials have been collected and sold for use in war production by the American plants of Monsanto Chemical Co.

Monsanto's salvage department has reported that 3,200,000 pounds of scrap iron alone have been collected in the campaign, which was started last spring.

New Koppers Plant

Koppers Co., Pittsburgh, is erecting a plant in an East Central state which will convert grain alcohol to butadiene and also produce styrene, products of vital importance to the manufacture of Buna-S synthetic rubber.

Rust Engineering Co., Pittsburgh, has been awarded a sub-contract for the erection of 35 concrete structures of the plant Koppers will operate the plant on lease.

Butadiene Plant Scheduled

Authorization to build a pilot plant for making butadiene from grain by first fermenting the grain to produce butanediol has been received from the Rubber Reserve Company by Joseph E. Seagram &

Magnus Congratulates Lieutenant Logcher

Commissioned a First Lieutenant in the Sanitary Corps of the Medical Department of the United States Army, Henri Logcher, one of the first few Netherlanders to be so honored, is congratulated by Percy C. Magnus, president of the New York Board of Trade and Magnus, Mabee & Reynard, Inc. Lieutenant Logcher was formerly purchasing agent in the New York offices of N V. Rathkamp & Co., a Dutch East Indies Pharmaceutical house and has long been a prominent figure in the export field and in Holland-American circles.

Sons, Inc., and work on the plant in Louisville already has begun.

New Monsanto Laboratories

Construction of 12 buildings for additional research and development near Moraine City, O., has been announced by Monsanto Chemical Co.'s Central Research Laboratory Department at Dayton. Construction will be completed about Dec. 1.

New Magnesium Plant

Production began late last month in the newly-constructed $16,000,000 plant of the Diamond Magnesium Co., somewhere in Ohio. The plant's first magnesium was poured at ceremonies attended by Army, WPB and Defense Plant Corp. officials. Construction had begun right after Pearl Harbor.

Merck School Started

The Merck Training School, sponsored by Merck & Co., Inc., Rahway, N. J., has started classes in subjects essential to the war effort, and all employees have been invited to attend the classes, although enrollment is entirely voluntary.

GENERAL

Cornell Dedicates Hall

Cornell University held dedication ceremonies for its new Olin Hall of Chemical Engineering Oct. 3 and John Lyon Collyer, president of B. F. Goodrich Co. made the principal address.

The new building—which houses chemical engineering laboratories and classrooms for about 500 students—was presented to Cornell by Franklin W. Olin, president of Western Cartridge Co., who graduated from Cornell in 1886. It is dedicated to his son, Franklin Jr. who died in 1921.

Dr. Fred H. Rhodes is director of the School of Chemical Engineering.

Oil Analyses Reported

Complete analyses of oil samples from fields which produced more than 90% of New Mexico's petroleum in 1940 are embodied in a new report issued through the Bartlesville, Okla., petroleum experiment station of the Bureau of Mines.

In addition to giving analytical data on the character and type of the more important New Mexico crude oils, the report presents tables summarizing the production for 1940 and the cumulative production for each field under investigation.

A 36-page booklet entitled "Scrap and How to Collect It" has been printed, published and distributed as a public service by the American Industries Salvage Committee, 350 Fifth Ave., N. Y. City. The booklet, which is well-illustrated, answers questions from "What Is Scrap?" to "How Is Scrap Used?" It gives directions for campaigning by local salvage committees, too.

"The Scrapper" Issued

An 8-page tabloid newspaper called "The Scrapper," designed to promote and stimulate the gathering of scrap is being published and distributed by the American Industries Salvage Committee. All communications to the publication should be made to room 3303A, 350 Fifth Ave. The *Scrapper* will be sent without charge to anyone interested. Address requests for copies to 420 De Soto Ave., St. Louis, Mo.

Accident Prevention

The dramatic accident-prevention radio program, "Men, Machines and Victory," has been extended for 13 weeks as a contribution of the Blue Network to the important war work undertaken by the National Safety Council's War Production Fund to Conserve Manpower. New series opened Oct. 2 with Jane Cowl as narrator. New York broadcast has been changed from 10.30 P. M. to 11.15 P. M.

New "Poly" Professor

Department of chemistry, Polytechnic Institute of Brooklyn announces the addition of Dr. I. Fankuchen, formerly of Cambridge University to the graduate teaching staff during the coming academic year. Dr. Fankuchen is well known for his investigations in the field of X-ray and electron diffraction. This year he will present a combined lecture and laboratory course in "Chemical Anlaysis by X-ray and Electron Diffraction Methods."

Both lecture and laboratory sessions will be held on Saturdays from 9.00 A. M. to 1.00 P. M., beginning October 10.

Louisiana Rich Source

Louisiana is one of the world's richest regions of wartime supply, says a survey reported in "Ethyl News," publication of Ethyl Corp., which describes the state as a vast stockbin of oil, food, timber, minerals, and other raw materials essential to victory.

Free War Courses

New York University is sponsoring tuition-free evening war training courses in chemical, administrative, mechanical, aeronautical and civil engineering and in management and science. Full information as to admission and requirements may be had by writing to the War Training Office, Sage Building, University Heights, Bronx, N. Y.

Lauds Synthetic Organics

The training program is under the supervision of Ernest C. Bartell of Westfield, N. J., who prior to his association with Merck & Co. was an instructor at the Phillips Exeter Academy and Director of Personnel for the Allegheny Ludlum Steel Corp. Classes in specific subjects will be conducted by department heads and officials qualified to give instruction.

Exposition and the War

With the Industrial Salvage Section, Conservation Division of the War Production Board participating, the National Chemical Exposition set for November 24 to 29 at the Sherman Hotel in Chicago definitely will be a contribution to the war effort.

Arrangements have been concluded by the Industrial Salvage Section with the Chicago Section of the American Chemi-

Acme Steel Says "Buy Bonds"

The Treasury Department's recent request for local sponsorship of 24 sheet War Bond posters brought immediate response from more than 2,600 firms and individuals. Typical of the messages now appearing in the Chicago area is the one pictured which has been posted on U. S. Highway 54 at the southern limits of Chicago and adjacent to the Riverdale plant of the sponsor, an important producer of war materials.

cal Society, sponsor of the show, for adequate space for an educational exhibit which will stress the campaign to salvage approximately 100,000 pounds of essential chemicals.

"Our program provides for the reclamation of millions of gallons of war-essential chemical solvents, paints of all kinds, oils and chemical by-products and we have appealed to the sponsors of the show to cooperate," said S. Donald Perlman, Executive Chemical Director of the Industrial Salvage Section, Conservation Division, WPB.

It is expected that attendance at the coming exposition will exceed that of the first show held in 1940. Exhibit space has been assigned to more than 100 firms in the chemical and allied industries including manufacturers of equipment, precision instruments, materials and products.

A feature exhibit will be a gallery of Micrographs contributed by 40 laboratories which are using the Electronic Microscope.

Another contribution will be the "New Chemicals for Industry" booth of CHEMICAL INDUSTRIES.

Leaders in the chemical industry, educators and other authorities will appear on the conference program which will extend through the period of the exposition. The conference will be in the nature of a forum. The general subject of applied chemistry and chemical research with particular emphasis on fields related to the war effort, will be featured at the conference.

Mellon Lectures Set

A series of lectures on recent advances and current trends in the American chemical industry is being presented by technologic specialists of Mellon Institute of Industrial Research during 1942-1943. These discourses, which will be delivered on alternate Wednesdays, in the fourth period (11.30 A. M.-12.30 P. M.), throughout both semesters, in the auditorium of the Institute, will be open to all students in the professional courses in chemical engineering and chemistry in the University of Pittsburgh, as well as to the Institute's members.

Much Scrap Found

Tons of scrap rubber and metal, in obsolete or unused office equipment, represent an untapped reservoir for the nation's salvage drive, Ralph B. McKinney, in charge of the Hercules Powder Co. salvage campaign announced recently.

"Factories and homes are being urged to turn in scrap but no one seems to pay much attention to the metal and rubber in thousands of American business offices," he pointed out.

A survey concluded recently within the chemical company's main offices has turned up between 1½ and 2 tons of valuable scrap metals for the Delaware salvage pile, he reported.

National Smelting Co. Pledges Workers to the Cause

A new idea for bringing home to war plant workers a sense of their immediate, personal responsibility to the Nation at war was inaugurated at a giant Production-for-Victory Rally of employees of the National Smelting Co., Cleveland, this month.
In a formal ceremony of self-dedication, witnessed by 1200 employees and guests, labor and management representatives enrolled themselves as "Production Soldiers" by swearing a solemn oath pledging their "hearts and hands to the country's cause on the battle lines of war production."
The oath was administered by the Hon. Robert N. Wilkin, U. S. District Judge. Each man received a large, handsomely printed citation certificate bearing the company seal, attesting to his having sworn the "Production Soldier's Oath."

Brown Moves to Maine

Brown Co.'s chemical sales division is now located at 465 Congress St., Portland, Me. Company's chemical plants together with its huge pulp and paper mills are located at Berlin, N. H. The sales division has previously been in Boston.

William H. Barry, sales manager of the chemical division, will make his headquarters at the Portland address.

All About Columbus

A story concerning Columbus, is discussed in the October number of *Priorities,* house magazine of Prior Chemical Corp. The articles is timely, coming as it does, with the celebration on Oct. 12 of the 450th anniversary of the discovery of America.

Celebrate 140th Year

September issue of the Du Pont Magazine commemorates the 140th anniversary of the Du Pont Company. Its 36 pages are devoted to the story of Du Pont in the war effort together with a general broad review of the company's history.

ASSOCIATIONS

Fertilizer Convention

Annual Southern Convention of the National Fertilizer Association will be held Nov. 16, 17 and 18 at the Biltmore Hotel, Atlanta, Ga.

This convention date, one week later than originally planned, has been selected to avoid conflict with the American Society of Agronomy annual and other important committee meetings which will be held in St. Louis, Nov. 9-13..

New Manual Out

A new manual, TC-4, on "Unloading of Tank Cars Containing Inflammable Liquids," has been offered by the Manufacturing Chemists' Association, Washington, D. C., at 12 cents per copy. The association also has revised its manuals TC-3, "Unloading of Tank Cars Containing Liquid Caustic," (10 cents) and H-1, "Recommended Practice for the Safe Handling and Discharge of Hydrofluoric Acid Containers," (15 cents). Address is 608 Woodward Building.

Packaging Meeting

Annual meeting of the Packaging Institute, Inc., will be a two-day session at the Hotel New Yorker, N. Y. City, November 5 and 6. A full program devoted to the general wartime packaging picture has been scheduled. In addition a display of the collection of wartime packages of Arthur S. Allen will be featured.

Joel Y. Lund, Lambert Pharmacal Co., St. Louis, is president of the association.

Schwarcman Speaks

A discussion of research work on drying oils was given by Dr. Alexander Schwarcman, research director of Spencer Kellogg, at the Sept. 29 meeting of the St. Louis Paint & Varnish Production Club.

TAPPI Meets

A new method of bleaching rag stock for high-grade writing papers was described at the Boston meeting of the Technical Association of the Pulp and Paper Industry Oct. 1 by Dr. G. P. Vincent, of the Mathieson Alkali Works, Inc., New York.

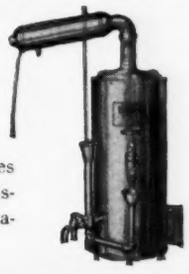
In this process, the bleaching agent employed is a mixture of sodium chlorite, which is known to the paper industry as C2, and hypochlorite, the chemical ordinarily used for rag-stock bleaching.

Any Time You Need Pure Water

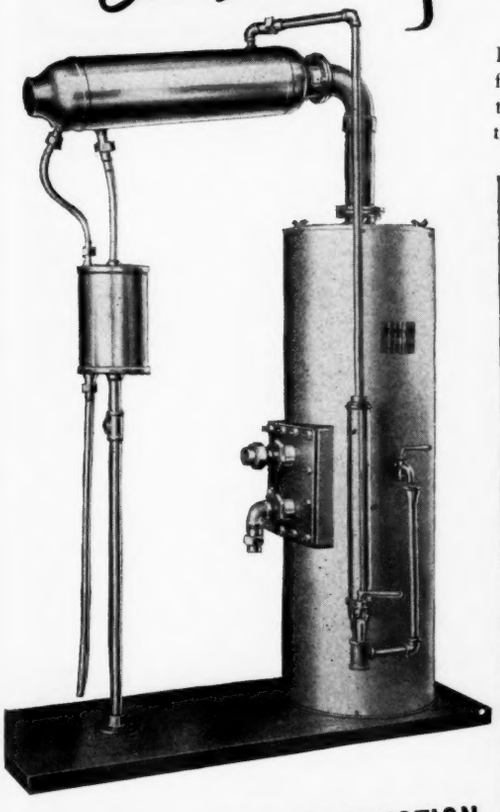
Here's the Best Way to Get It...

Chemical plants have a wide range of requirements for pure distilled water. Some plants need only a small amount for their labs, some need large volumes for the actual production of their products. But whatever the amount required, there is a Barnstead Water Still that will produce it *consistently pure* at a minimum of cost or manual attention.

FOR LABORATORY WORK



Barnstead laboratory type water stills — either standard types for distilling soft water or Extra Duty types for hard water distillation — range from ½ to 3 gallons per hour output. Operation of these stills is by gas, steam or electricity.

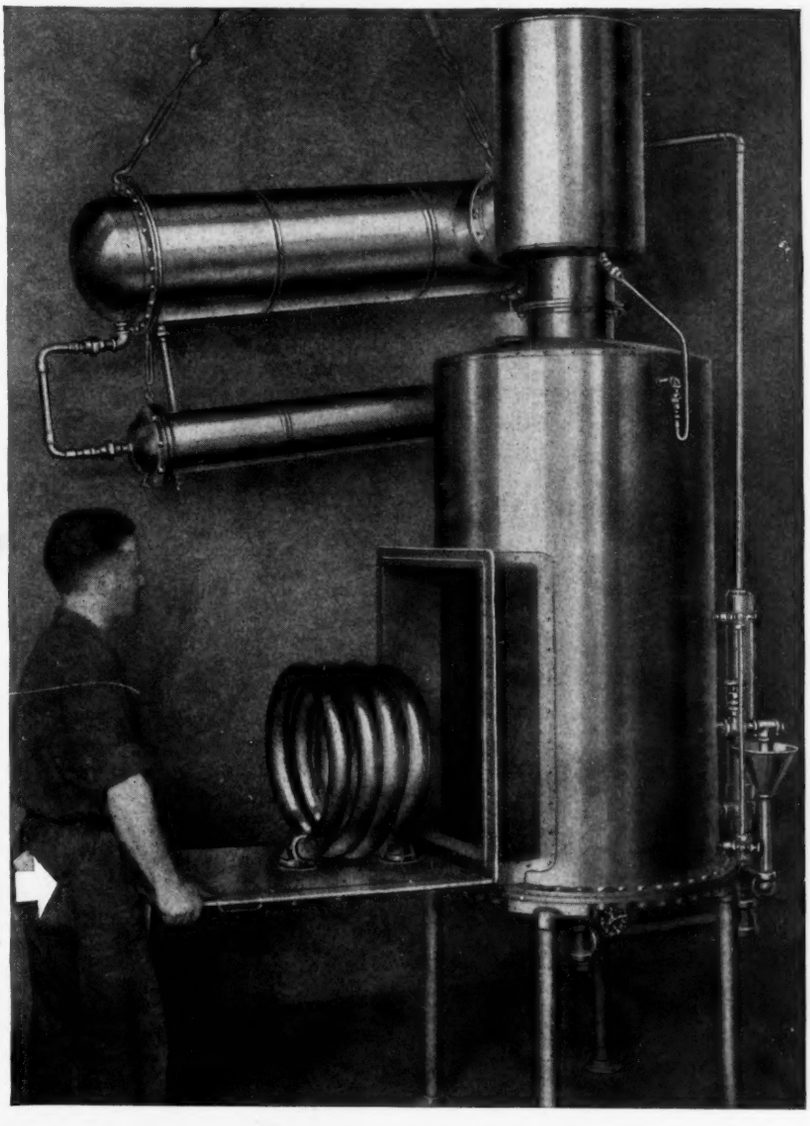


FOR SMALL PLANT PRODUCTION

Where medium amounts of pure distilled water are required, Barnstead offers Standard or Extra Duty type stills ranging from 5 to 30 gallons per hour 5 to 10 gallon stills operate by steam, gas or electricity. Stills from 15 to 30 gallons are operated by steam only.

FOR LARGE PLANT PRODUCTION

For plants requiring large amounts of pure distilled water, Barnstead manufactures stills ranging from 50 to 500 gallons per hour. These are all steam-heated Extra Duty type stills capable of producing purest distillates from even highly contaminated water, at a low-operating cost.



Barnstead
STILL & STERILIZER CO. Inc.

In addition to a complete line of water stills, Barnstead can give you distilled water storage tanks in many sizes and all types of mounting facilities.

49 LANESVILLE TERRACE, FOREST HILLS, BOSTON, MASSACHUSETTS

Reizenstein Speaks

Monthly meeting of the Philadelphia Paint & Varnish Production Club was held Oct. 8. Speaker of the evening was Louis J. Reizenstein, of Falk & Co., whose topic was "Resin and Oil Emulsion Paints."

Philly Club Golfs

The Chemical Club of Philadelphia held its Fall golf outing at the Torresdale-Frankford Country Club in suburban Philadelphia, Sept. 22. Forty-five members and guests participated.

BIMS Tourney Played

BIMS of New York closed the 1942 golf season at the Ridgewood Country Club, Ridgewood, N. J., on Sept. 22 with 100 members and guests in attendance for the golf tournament and dinner.

Among the day's low scorers were Paul A. Dunkel of Paul Dunkel & Co., Louis Bezard of Bourjois, Inc. and Ralph M. Stevenson of Givaudan-Delawanna, Inc. for the members, and Herbert Parker, guest of Harry Heister of George Lueders & Co.

Winkelmann Speaks

Dr. Herbert A. Winkelmann, technical director of the Dryden Rubber Co., spoke at a meeting of the Midwest Section, American Association of Cereal Chemists, Oct. 5 in Chicago. His topic was synthetic rubber.

Egloff to be Honored

Dr. Gustav Egloff, Universal Oil's director of research and president of the American Institute of Chemists, will be honored by the New York Chapter at a dinner to be held Oct. 23 at the Chemists' Club. G. L. Royer, Cyanamid's Calco Division, is chairman of the New York Chapter's Program Committee.

The American Institute of Chemists through the newly formed Chicago Chapter of that Society is honoring Prof. Vladimir N. Ipatieff with a banquet on the occasion of his 75th birthday. Dinner is scheduled for Nov. 21. Among those invited to speak is USSR Ambassador Maxim Litvinov.

Officers of the newly formed Chicago Chapter are: Dr. V. Voorhees, Standard of Indiana, chairman; H. I. Jones, Hizone Products, vice-chairman; and Dr. C. L. Thomas, associate research director, Universal Oil Products, secretary-treasurer.

September meeting of the Chicago group was featured by a discussion of "The Chemist in Three Wars," delivered by Dr. Otto Eisenschiml, president, The Scientific Oil Compounding Co. Dr. Eisenschiml made the very novel suggestion that qualified chemists should be sent to each of the battlefronts so that on-the-spot suggestions could be made to military authorities and reports sent back to research agencies in this country.

Power Exposition Set

Fifteenth biennial Exposition of Power and Mechanical Engineering, originally scheduled for the Grand Central Palace, N. Y. City, from Nov. 30 to Dec. 5, will be held instead at Madison Square Garden from Nov. 30 to Dec. 4. The Army has taken over part of the Palace for an induction center.

Consultants Listed

A clearing house for consultants has been established by the Association of Consulting Chemists and Chemical Engineers, Inc., 50 East 41st Street, to assist industry, large and small, which must produce more and better than ever and under steadily increasing difficulties.

Within the past year the association, with a membership from coast to coast, has received about 300 requests covering many different fields, and has been extremely successful in handling these matters. Inquiries are taken care of promptly, and industry should avail itself to the fullest extent of this free service.

Plastic Group Certified

Plastic War Production Association, a group of leading plastics firms in the Metropolitan area with headquarters at 122 East 42d Street, N. Y. City, has been certified by the WPB "as a war production association appropriate in form and character to the fulfillment of the objectives of the War Production Board." The certification has been formally approved by the Attorney-General.

The purpose of the PWPA is to pool the engineering, research and manufacturing facilities of its members for the benefit of the various Government branches placing war contracts. The membership of PWPA consists of plastics concerns whose facilities are widely varied as to types of work. By coordinating the combined facilities of the group, the maximum contribution to the war effort is made by members of the association.

C A I Meets

Compressed Air Institute held a 2-day meeting at Hotel Hershey, Hershey, Pa., Sept. 10 and 11 for interchange of ideas in an effort to further streamline and speed up the output of vitally-needed compressed air equipment.

Research Group Meets

The Industrial Research Institute held the largest meeting in its history in Buffalo, N. Y., last month at the Hotel Statler.

Missouri Association Meets

Fifth meeting of the Associated Drug & Chemical Industries of Missouri, Inc., was held at Normandy Golf Club, St. Louis, last month. Prizes were won by the following members. Ray Caulk, Monsanto Chemical Co., Eugene Meyer, United Drug Co., Franc A. Barada, Fritzsche Brothers, Inc., Ernest Stehlby, Monsanto Chemical Co., Louis J. Farley, American Can, H. D. McGowan, General Chemical Co.

Rubber Group Meets

Chicago Rubber Group opened the 1942-43 season with its first technical meeting of the year Oct. 16, at the Bismarck Hotel. The speaker of the evening was Dr. I. Drogin, Director of Research of the United Carbon Co., Inc., who presented a paper entitled "A Study of Carbon Black in Natural and Synthetic Rubbers."

California Chemical Salesmen on Their Outing

The Chemical Salesmen's Association of California recently enjoyed an outing at the summer home of Charles Beringer, located in the mountains above his famous winery near St. Helena, Calif. Above are the members who were guests at the Sept. 26 affair. (Mr. Beringer is fourth from the left, standing).

PERSONNEL

Col. Charles R. Baxter, Army Ordnance Department, has been appointed chief of the newly-created materials distribution branch of WPB. . . . **John M. Hamilton,** sales manager of the carbon black division of Binney & Smith Co., N. Y. City, has resigned to accept a commission in the U. S. Navy. J. W. Snyder carries on where Hamilton left off.

Henry J. Guzewicz, N. Y. office sales engineer for the Dicalite Co., and **Joseph E. Moran,** manager of the company's Boston district, are now serving in the armed forces. Moran has been commissioned in the U. S. Navy. Guzewicz was recently assigned to active duty with the U. S. Coast Guard.

Dr. Charles W. Rippie, formerly petroleum technologist for Solvay Sales, has joined the petroleum chemicals department of the organic chemicals division of Monsanto Chemical Co., St. Louis, where he will handle technical sales work.

Dr. Rippie served in research, manufacturing and sales capacities with the Shell Oil and Cities Service Oil before going to Solvay. He received his bachelor's degree in chemistry from the University of Michigan and continuing later with graduate work in chemistry at the University of Illinois received the doctor's degree from that school in 1926.

Colonel H. A. Kuhn, Commanding Officer of the New York Chemical Warfare Procurement District, has been assigned to duty in the Office of

the Chief, Chemical Warfare Service, Washington, D. C. His position as Commanding Officer of the New York District was assumed by **Colonel Patrick F. Powers.**

R. A. Ornberg has recently been appointed Advertising Manager of American-Marietta Co., Chicago, succeeding **Z. H. Mischka,** who has joined the staff of Russell T. Gray, Inc.

Sydney Thayer, first vice-president and treasurer of Henry Bower Chemical Manufacturing Co., Philadelphia, has been commissioned a Captain in the U. S. Marine Corps. Thayer, holder of the Distinguished Service Cross, Navy Cross and Croix de Guerre, participated in all major engagements in which the Marines took part in the last war. He was honorably discharged as a first lieutenant having been severely wounded five hours before the Armistice was signed.

Robert C. Sessions of the consulting engineering firm of Sessions & Sessions, Cleveland, has been appointed chief engineer of the Brown Fintube Co., Elyria, O.

Thomas F. Lynch has been appointed production superintendent of the chemical plant of Naugatuck Chemical division of U. S. Rubber Co. . . . **George M. Emery** has been made production superintendent of the rubber reclaiming plant.

Dr. Robert E. Wilson has been selected to receive the Perkin Medal of the Society of Chemical Industry for 1943. This medal is awarded annually

for outstanding work in applied chemistry and the medalist is selected by a committee representing the five chemical societies in the United States.

The medal will be presented Jan. 8, 1943 at the Chemists' Club, N. Y. City.

Dr. Robert J. Moore, manager of Bakelite's Development Laboratories, was guest speaker at the monthly luncheon meeting of the Engineers' Club (New York) held on Oct. 8, subject: "Synthetic Resin Plastics." Dr.

Moore discussed before an audience of 150 the application of synthetic resins to engineering applications, particularly in the light of present-day shortages of metals.

Albert H. Hooker, Jr., formerly Western sales manager for Hooker Electrochemical Co. in the Tacoma, Wash., plant, has been commissioned a Lieutenant-Colonel in the Chemical Warfare Service and is on duty in Washington, D. C.

Dr. G. S. Whitby, one of the outstanding fundamental research chemists in the field of rubber chemistry, has been added to the faculty of Akron University as professor of rubber chemistry.

Herbert E. Smith was elected president of the U. S. Rubber Co. last month.

Dr. Chester M. Suter, professor of organic chemistry at Northwestern University and chairman of its department of chemistry, has been appointed director of chemical research of the Winthrop Chemical Co., Inc. He has assumed his new duties at the company's laboratories in Rensselaer, N. Y.

Charles A. Blatz, for 61 years an active figure in the paint industry, has retired from the Blatz Paint Co., Louisville, Ky., and has sold his interest in that company.

OBITUARIES

D. H. Gates

D. H. Gates, 71, president of the Gates Manufacturing Co., paint makers, died Sept. 26 of a heart attack, at Charleston, W. Va.

Carl Nelson Hand, chemical engineer and retired plant manager of the rubber service department of Monsanto Chemical Co., died September 18 at Charleston, W. Va. He was 50 years old.

Ross A. Gortner

Dr. Ross Aiken Gortner, 57, chief in the Division of Biochemistry at the University of Illinois, eminent scientist and scholar, died Sept. 30 of a heart attack.

Dr. Gortner, who was internationally known for his accomplishments in the chemistry of cereals, had done outstanding work in the improvement of bread flours.

He had headed the biochemistry division at Minnesota since 1917 and last May received the Osborne Medal, given annually by the American Association of Cereal Chemists.

He was a prolific writer and the author of a widely used textbook, "Outlines of Biochemistry."

Joseph E. Lockwood

Joseph E. Lockwood, widely known naval stores consultant, died at his home in Savannah, Ga., Oct. 3 after a brief illness. He was 81 years old.

Mr. Lockwood was named in 1908 to investigate and assist in perfecting a process for extracting rosin and turpentine from fat pine stump and waste wood, and later became general manager of the Yaryan Naval Stores Company.

He directed erection of company plants at Gulford, Miss., and Brunswick, Ga. When the concern was taken over by the Hercules Powder Company, Mr. Lockwood was made director of sales for the naval stores department of Wilmington, Del., and once served as assistant to the general manager of the Hercules naval stores department.

He resigned 11 years ago and established his home here, opening an office as a naval stores consultant. In 1935, he aided the Bureau of Chemistry and Soils in the compilation of statistical reports, and recently spent several months in Washington assisting in a survey of naval stores producing costs, marketing and price conditions for the Office of Price Administration.

Isaac W. England

Isaac W. England, vice-president of Continental Can Co. died Sept. 18 of a heart ailment at Watkins Glen, N. Y. He was 68 years old.

Benjamin Foster

Benjamin Foster, founder and president of the Philadelphia company bearing his name, died Sept. 12.

STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., REQUIRED BY THE ACT OF CONGRESS OF AUGUST 24, 1912 AND MARCH 3, 1933

Of *Chemical Industries,* published monthly except twice in October, at New Haven, Conn., for October 1, 1941.

State of New York, County of New York, ss.

Before me, a Notary Public in and for the State and county aforesaid, personally appeared Walter J. Murphy, who, having been duly sworn according to law, deposes and says that he is the Editor of the *Chemical Industries* and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management (and if a daily paper, the circulation), etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, as amended by the Act of March 3, 1933, embodied in section 537, Postal Laws and Regulations, printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business managers are: Publisher, Tradepress Publishing Corporation, 522 Fifth Avenue, New York, N. Y.; Editor and Manager, Walter J. Murphy, 522 Fifth Avenue, New York, N Y.; Managing Editor, none.

(2) That the owner is: (If owned by a corporation, its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding one per cent. or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a firm, company, or other unincorporated concern, its name and address, as well as those of each individual member, must be given.) Tradepress Publishing Corporation, 522 Fifth Avenue, New York, New York. The stockholders of the Tradepress Publishing Corporation are: John R. Thompson, 2511 Coyle Avenue, Chicago; J. L. Frazier, 2043 Orrington Avenue, Evanston, Illinois; Col. J. R. MacLean, 7 Austin Terrace, Toronto, Ontario; Horace T. Hunter, 120 Inglewood Drive, Toronto, Ontario; The MacLean Publishing Company, Ltd., 481 University Avenue, Toronto, Ontario.

3. That the known bondholders, mortgagees, and other security holders owning or holding one per cent, or more of total amount of bonds, mortgages, or other securities are: (If there are none, so state.) None.

4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him.

5. That the average number of copies of each issue of this publication sold or distributed, through the mails or otherwise, to paid subscribers during the twelve months preceding the date shown above is ——. (This information is required from daily publications only.)

WALTER J. MURPHY,

Editor.

Sworn to and subscribed before me this 30th day of September, 1942. Philip Baumeister, Notary Public, Bronx County Clerk's No. 283, New York County Clerk's No. 1553, New York County Register's No. 3B-939. Commission expires March 30, 1943.

(Continued from Page 588)

Solvit A (Cont'd)

sions. Has been especially used for the emulsification of vitamins. This compound recently has been approved by the American Medical Association for its use in vitamins. Toxicity, non-toxic. U. S. Patent #2,236,517. The Emulsol Corp.

SPECIAL AMBER WAX

Flash, 550. Fire, 620. Viscosity, 84. M. P., 185. Penetration, 23. American Wax Sales Corp.

STANNIC IODIDE

SnI_4. Mol. Wt., 626.4. Orange-red crystals. Sp. Gr., 4.46. M. P., 143-5°C. Decomposed by water. Soluble in alcohol, carbon disulfide, ether, chloroform. Uses, laboratory reagent, catalyst, etc. Organic Products Co.

STROBAWAX NEW

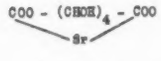
Synthetic wax. Consistency, hard wax. Color, tan. M. P., 98-103°C. Colloidally soluble in hydrocarbons (hot), forms gels on cooling. Suggested uses, flatting agent for varnishes, lacquers and paints. High melting wax for manufacture of polishes, record waxes, insulation waxes, etc. Glyco Products Co., Inc.

STRONTIUM METAL

Symbol Sr. Atomic Wt., 87.63. Sp. Gr., 2.6. M. P., 800°C. B. P., 1150°C. Crystal Structure, face centered cubic. Resembles calcium in its properties. A vigorous electro positive metal which combines vigorously with the non-metallic elements. Uses, Clean-up agent in producing high vacuum and as a scavenger in metallurgy. King Laboratories Inc.

STRONTIUM SACCHARATE

Mol. Wt., 295.63. Insoluble in water. Color, slightly grey. Odor, none. Suggested use, clarifier. Availability, in commercial quantities. Brocker Chemical Co.



SUCCINIC ANHYDRIDE

Empirical formula, $C_4H_4O_3$. Mol. Wt., 100.07. Crystallizing Pt., 118.0°C. Appearance, white crystalline material. Suggested uses, in the manufacture of resins and in chemical syntheses. Available only in small quantities for experimental investigation. Monsanto Chemical Co.

SULFAMATE LEAD PLATING SALTS

A compound, containing sulfamic acid and sulfamates for preparation of an improved, less toxic, lead plating solution. Three pounds per gallon are used in conjunction with addition agents. Solution is operated at ordinary temperatures (75°-115°F.), in usual lead plating equipment. More concentrated solutions may be prepared for more rapid plating. E. I. du Pont de Nemours & Company, (Inc.).

SULFUR PENTOXYDICHLORIDE

$S_2O_5Cl_2$. Mol. Wt., 215.0. Density, 1.837. Boiling Point, 150°C. Solubility in water; slowly soluble in cold water, but reacts violently with water on warming. Odor, pungent. Color, light straw. Chemical properties: its miscibility with a large variety of organic liquids makes sulfonation and chlorination possible under homogeneous conditions. The compound reacts readily with ethylene linkages, hydroxyl groups, and amino nitrogen. Suggested uses, for solubilization of petroleum, vegetable, and fish oils. This compound is available only in small quantities for experimental investigation. E. I. du Pont de Nemours & Company, (Inc.).

m-TERPHENYL

Empirical formula, $C_{18}H_{14}$. Mol. Wt., 236. Density, 1.164 g./cc. @ 25°C. Color (NPA), 2.2-4.2. Softens at 75°C. Completely liquid at 85°C. Distillation range D-20 (corrected), 370-378°C. Flash Pt., 207°C. Flame Pt., 229°C. Viscosity (Saybolt univ. sec.), 39.3 @ 210°F. Dielectric constant, 2.62. Resistivity in ohms/cm³, 2,600 x 10^9 @ 100°C. Suggested uses, in the synthesis of dyes, drugs and other organic compounds. Available in commercial quantities. Monsanto Chemical Co.

o-TERPHENYL

Empirical formula, $C_{18}H_{14}$. Mol. Wt., 236. Density, 1.14 g./cc. @ 25°C. Color (NPA), less than 3.0. Softens at 35°C. Completely liquid at 50°C. Distillation range D-20 (corrected), 320-355°C. Flash Pt., 171°C. Flame Pt., 193°C. Viscosity (Saybolt univ. sec.), 40 @ 210°F. Dielectric constant, 2.54. Resistivity in ohms/cm³, 8,200 x 10^9 @ 100°C. suggested uses, in the synthesis of dyes, drugs and other organic compounds. Available in commercial quantities. Monsanto Chemical Co.

p-TERPHENYL

Empirical formula, $C_{18}H_{14}$. Mol. Wt., 236. Density, 1.236 g./cc. @ 25°C. Color (NPA), 0-1.25. Softens at 200°C. Completely liquid at 215°C. Distillation range D-20 (corrected), 381-388°C. Flash Pt., 207°C. Flame Pt., 238°C. Resistivity in ohms/cm³, 30 x 10^9 @ 250°C. Suggested uses, in the synthesis of dyes, drugs and other organic compounds. Available in commercial quantities. Monsanto Chemical Co.

TERPHENYL, Mixed Isomers

Empirical formula, $C_{18}H_{14}$. Mol. Wt., 236. Density, 1.133 g./cc. @ 25°C. Color (NPA), 4-5. Softens at 60°C. Completely liquid at 140°C. Distillation range D-20 modified (corrected), 364-418°C. Flash Point, 191°C. Flame Point, 238°C. Dielectric constant, 2.58. Resistivity in ohms/cm3, 140,000 x 10^9 @ 100°C., 35,000 x 10^9 @ 135°C., 550 x 10^9 @ 155°C. Soluble in benzene, trichlorobenzene, nitroethane, nitropropane. Suggested uses, in the synthesis of dyes, drugs and other organic compounds. Available in commercial quantities. Monsanto Chemical Co.

TETRACHLORORESORCINOL

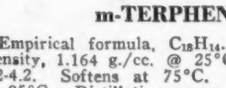
Empirical formula, $C_6Cl_4(OH)2$. Mol. Wt., 248. M. P., 141°C. Soluble in organic solvents, especially alcohols, and in aqueous $NaHCO_3$ solution. Sparingly soluble in cold water, but more soluble in hot water. It is a mild reducing agent and the hydroxyl groups are otherwise reactive. Suggested uses, as a germicide, fungicide, and intermediate. Pennsylvania Salt Mfg. Co.

TETRAETHANOLAMMONIUM HYDROXIDE

$N(C_2H_4OH)_4OH$. Mol. Wt., 211.18. White, crystalline solid, very soluble in water and methanol. Melts at 123°C. The commercial product is an aqueous methanol solution, containing 40 to 41 per cent of the hydroxide. This solution is a clear, amber liquid having a specific gravity of 1.15 to 1.17. It is a strong base, approaching the fixed alkalies in alkalinity. Its aqueous solutions are stable at ordinary temperatures, but decompose upon heating to form weakly basic tertiary amines. Uses, in processes where it becomes desirable to destroy a strong base that has been useful at lower temperatures. It is an excellent solvent for certain types of dyes. Unlike stronger quaternary bases, it is not a solvent for cellulose. Carbide and Carbon Chemicals Corporation.

TETRAETHYLTHIURAM DISULFIDE

Mol. Wt., 296.52. Sp. Gr., 20°/4°C., 1.17. M. P., 65-70°C. Color, light tan. Odor, slight. Toxicity, nontoxic as ordinarily used, but may cause dermatitis in some people by prolonged contact with moist skin. Solubility, insoluble in water, dilute caustic, gasoline. Soluble in carbon disulfide, benzol, chloroform. Uses, ultra accelerator of vulcanization sold to the rubber industry exclusively by the R. T. Vanderbilt Co. Sharples Chemicals Inc.



Tetraethylthiuram Disulfide (Cont'd)

TETRAHYDROFURFURYL LEVULINATE (S465)

Empirical formula, $C_{10}H_{16}O_4$. Mol. Wt., 200.1. Consistency, liquid. Color, yellow. B. P., 169°C. (@ 15 mm. Hg.). Soluble in water, ethanol, toluene, naphtha, diethylene glycol. Suggested uses, plasticizer, solvent. Glyco Products Co., Inc.

"TEXON"

Latex impregnated fiber for innersoles, midsoles, and quarter lining. For civilian use. E. I. du Pont de Nemours and Company, Inc.

THEOP (Tri-12-(1-hydroxyethanoyl)-9-octadecenoyl-1, 2, 3-propanetriol)

Empirical formula, $C_{68}H_{112}O_{18}$. Mol. Wt., 1119. Consistency, viscous fluid. Color, yellow. Sp. Gr., 1.00 @ 28°C. Sap. Val., 275-285. Iod. Val., 72. Volatility, nil (4 hrs. @ 105°C.). Miscible with alcohol, acetone, chloroform, vegetable oil, and aromatic hydrocarbons. Miscible hot in mineral oil. Immiscible with water and naphtha. Compatible with nitrocellulose, ethyl cellulose, rosin, ester gum, and synthetic resins. Suggested uses, plasticizer for synthetic rubber, ethyl cellulose, and similar compounds. Glyco Products Co., Inc.

"TONTINE"

Pyroxylin impregnated washable window shade cloth. For civilian use. E. I. du Pont de Nemours and Company, Inc.

TRAGSUB W-1427

Specially converted starch. Jacques Wolf and Company.

TRIBUTYL GLYCEROL TRIPHTHALATE

T.G.T. is a plasticizing agent whose solvent power and compatibility compare to those properties of dibutyl phthalate. The vapor pressure of T.G.T. is considerably lower than that of dibutyl phthalate, as would be expected from the partial substitution of glycerine for butyl alcohol as the esterifying alcohol. The most important use for tributyl glycerol triphthalate appears to be as a plasticizing agent for certain types of synthetic rubber, where its improved working properties and low volatility offer unique advantages. American Cyanamid Chemical Corp.

TRICHLORETHANE

$ClCH_2CHCl_2$. Mol. Wt., 133.4. Sp. Gr. at 20/20°C., 1.4432. Boiling Point at 760 mm., 113.7°C. Colorless, volatile, non-flammable liquid soluble in most organic solvents, but difficultly soluble in water (0.48 per cent at 25°C.). Stable under ordinary conditions of use. Uses, a good solvent and extractant for most oils, fats, and waxes, as well as natural and certain types of synthetic rubber. Carbide and Carbon Chemicals Corporation.

1, 2, 4-TRICHLOROBENZENE

Empirical formula, $C_6H_3Cl_3$. Mol. Wt., 182.45. Sp. Gr., 1.454± 0.002 @ 25°C. Crystallizing Pt., 16.7°C. Appearance, colorless liquid. Suggested uses, chemical syntheses. Available only in small quantities for experimental investigation. Monsanto Chemical Co.

TRICHLOROBUTANES

Empirical formula, $C_4H_7Cl_3$. Mol. Wt., 161.47. Typical distillation, ASTM, D268-41; Initial,

For your convenience in asking for more information on these products use coupon on page 573.

Trichlorobutanes (Cont'd)

100-120°C., 10%, 135-145, 50%, 160-165, 90%, 175-195, Final 190-210. Density, 20/4°C.; 1.19-1.25. This mixture of polychlorobutanes consists largely of isomeric trichlorobutanes with 1,2,3,-trichlorobutane (b.p. 169C.) predominating. Suggested uses: in paint removers, grease-removing compounds, and other applications where good solvent power and low volatility are desirable, in chemical synthesis. Produced by Shell Development Co., Selling Agent, R. W. Greeff & Co., Inc.

TRIGLYCOL DICHLORIDE

$Cl(CH_2CH_2O)_2CH_2CH_2Cl$. Mol. Wt., 187.07. Sp. Gr. at 20/20°C., 1.1974. Boiling Point, 241.3 (760 mm.). Solubility in water, 1.9%. Resembles dichlorethyl ether, but is slightly more soluble in water and less volatile. Uses, as a chlorinated solvent and extractant because of its excellent dissolving power for oils and hydrocarbons. It shows promise wherever low volatility is desired, such as for plasticizer applications. By exchanging its chlorine atoms for other chemical groups, it offers possibilities as an intermediate for making dyes, resins, or insecticides. Carbide and Carbon Chemicals Corporation.

TRIMETHYLOLETHANE, PURE

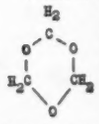
$CH_3C(CH_2OH)_3$. Mol. Wt., 120. Solid, white crystalline, polyhydric alcohol which contains three primary hydroxyl groups. Hydroxyl Value, 41.5. Ash, 0.02%. Moisture Content, 0.2%. M. P., 199-201°C. Soluble in water in all proportions. A raw material for the plastics and coatings industries, as well as for organic synthetic work. Heyden Chemical Corp.

TRIMETHYLOLPROPANE, TECHNICAL

$C_2H_5C(CH_2OH)_3$. Mol. Wt., 134. Solid polyhydric alcohol which contains three primary hydroxyl groups. Hydroxyl Value, 34. Ash, 0.13%. Water Content, 0.5%. Congealing Point 47°C. Soluble in water in all proportions. A raw material for the plastics and coatings industries, as well as for organic synthetic work. Heyden Chemical Corp.

TRIOXANE

White crystalline compound melting at 63-64°C.



A unique form of anhydrous formaldehyde. Its high degree of compatibility with organic materials and the surprising ease with which its reactions may be controlled should make it particularly attractive for use in organic synthesis. In these respects it differs considerably from known commercial forms of formaldehyde. It is also unique in that it possesses no formaldehyde odor when pure and is relatively inert in the absence of strongly acidic catalysts. It is converted to reactive monomeric formaldehyde by traces of acidic catalysts such as mineral acids, zinc chloride, ferric chloride, etc. In the presence of these materials trioxane reacts as formaldehyde with many organic compounds at a rate determined by the catalyst concentration and the temperature of the reaction media. In its molten form it is also an excellent solvent alone or in combination with water, alcohol and other organic solvents. Available in small quantities for experimental investigation. E. I. du Pont de Nemours & Company, (Inc.).

VEG-A-LOID (Vegetable Gum)

This is a material extracted from a domestic vegetable. It is a gum of unknown formula. It has a high uronic acid content and shows unusual protective colloidal effects. It can be used for most purposes where Pectin, Agar, Locust Bean or similar gums are now used—manufacturing jellies, various bakers supplies, as a protective colloid in dehydration, as a stabilizer in ice cream and ices, and other uses. This material is available in quantity and general use. Coleer Pectin Co.

"VENTUBE"

Rubberized flexible ventilating duct for coal and metal mines. For civilian use. E. I. du Pont de Nemours and Company, Inc.

VINKO

Zinc calcium resinate solution in volatile solvents with high viscosity and low solids. Typical product using petroleum naphtha of boiling range 200 to 250°F. Has 'U' viscosity at 50% solids. Extremely fast solvent release. Melting point of recovered resin 190°C. cap. tube. Uses, flash dry inks and fast drying paint vehicles. Newport Industries, Inc.

VINYL 14

Latex replacement. Highly elastic vinylite type. Deposits a tacky film and possesses good adhesive and binding properties. Used to impregnate or coat cloth or paper as a base beneath lacquers. Good binder for pigments. Replacement for latex in impregnation and beater sizing of paper. Available in a wide range of concentrations and viscosities. American Resinous Chemicals Corporation.

VINYL CYANIDE (Acrylonitrile)

(CH_2=CH—CN). Mol. Wt., 53.05. M.P., —83°C. B. P., 76.5-78.5°C. (760 mm.). Density 0.806 @ 20°C. Refractive Index 1.3911 @ 20°C. Colorless liquid soluble in alcohols, esters, ethers, aromatic and some aliphatic hydrocarbons; flammable and toxic. Characteristic nitrile and ethylenic chemical reactivity and polymerizable to high-melting or infusible solids. Uses, synthetic organic chemistry, polymerization and copolymerization to synthetic rubber and resins. Under W.P.B. allocation, GPO M-153. E. I. du Pont de Nemours & Company, (Inc.).

VODOL

An edible vegetable oil phosphatide obtained by a method of hydration from virgin corn oil. It has the following analysis: Acetone Soluble (Free Oil), 30 to 35%. Phosphorous, 2.3%. Nitrogen, 1.1%. Moisture (volatile at 105°C), 0.25%. Petroleum Ether Insoluble, 0.0%. Vodol is soluble in mineral, fatty, and essential oils, and in organic solvents, such as gasoline, naphtha, petroleum, ether, carbon tetrachloride, etc. It acts to lower surface tension, interface tension and viscosity in vegetable and mineral oils and fats. Uses, to lower the viscosity of chocolate, to increase the stability of oil and water emulsions, to inhibit reversion and oxidation of vegetable or animal oils and fats, particularly reversion of edible soya bean oil; to add to vegetable oils and fats used in oleo margarine to prevent spattering and sticking when the margarine is used for frying. Welch, Holme & Clark Co., Inc.

VULPRENE 56-45 D

Rubber-like elastomer. Used for extending rubber and as a substitute in moldings such as fire hose, gaskets and linings. Good fire and solvent resistance. Made of non-critical materials. American Resinous Chemicals Corp.

VULPRENE 72-28 A

Rubber-like elastomer. Tensile strength of 500 to 600 pounds. Elongations up to 200% maximum. Can be handled with conventional rubber equipment, and is vulcanized in customary manner. Good molding characteristics. Available in large quantities without priority. American Resinous Chemicals Corporation.

WITCARB

This new inert offers special advantages as a white reinforcing filler in rubber formulas requiring high tensile and modulus. In paint formulas, it provides such features as: lower cost per pigment pound; more gallons per pound; added texture in flats; better stability in finished product; improvements in lithopone and titanated lithopone paints, and in some cases gloss paints and enamels. Wishnick-Tumpeer, Inc.

WITCO BLANCAL

This precipitated barium-calcium compound is available in both low and high oil grades as an alternate to Blanc Fixe. It is said, in most cases, to give better results than Blanc Fixe, since it offers the following characteristics: extremely fine division; excellent color, in dry state as well as under oil; higher bulking value. Wishnick-Tumpeer, Inc.

WITCO YELLOW

A new synthetic pigment, Witco Yellow offers interesting possibilities for replacing French Ochres in rubber and paint manufacture. While practically the same in analysis as French Ochre, it is said to provide these advantages: greater strength, higher tinctorial value, cleaner final tint. Wishnick-Tumpeer, Inc.

ZINAR

M. P., 158-162°C. Sp. Gr. at 25°C., 1.162. Metallic Zinc content, 5.6%. Acid number, "slightly basic resin". Color, "M". A special Zinc Resinate developed for use with soft varnish oils to insure rapid set to touch together with good through dry. Also has special advantages in ethyl cellulose lacquers, rubber cements, calcicoater vehicles, road marking paints and other specialties. Newport Industries, Inc.

ZINC PEROXIDE (Medicinal Grade)

ZnO_2. Active oxygen 8.5%. A specialty preparation having a pH in water suspension substantially the same as that for body fluids, plus the characteristic of slowly releasing its active oxygen over a period of time in contact with body tissue. Applications of value in the medical, dental and veterinary fields. Available in limited commercial quantities. E. I. du Pont de Nemours & Company, (Inc.).

ADDITIONAL DESCRIPTIONS

BUNNATOL-G

A synthetic and reclaimed rubber plasticizer. This material is insoluble in mineral and vegetable oils, giving the finished rubber a greater resistance to greases and oils. It also acts as a wetting agent for pigments. The Beacon Co.

MYRISTILENE

A synthetic fatty acid. Sap. No., 204. Iodine No., 40.3. Titre, 40°. Suggested uses, for cosmetics, shampoos, shaving creams, household soaps, dry cleansing soap, wetting agents, rubber softeners, alkyd resins, metal polishes, insecticides, base chemical for synthesis and metallic soaps. The Beacon Co.

PALMALENE

A synthetic palm fatty acid of medium titre. Sap. No., 180-185. Iodine Value, 55-60. Titre, 35. Suggested uses, textile specialties, soap making, alkyl resins, polishes, wetting agents, cosmetics, rubber compounding, kier assistants, driers, and pulp and paper manufacture. The Beacon Co.

PLASTICIZER-B

A rubber plasticizer of particular interest for use with Buna-S and reclaimed stock. Plasticizer-B gives a lasting durability to dead rubbers. Usual percentage is 5 to 10% or less. This material works in very rapidly in milling, and cures well. It has little shrink. The Beacon Co.

SHELLAK

A synthetic shellac replacement. When cut by borax, ammonia, or alcohol, it dries with a bright continuous film. Can be used to replace shellac in bright-drying floor waxes and shoe polishes. Shellak is of particular interest as a replacement in the rubber industry for coating molded goods. When it is cut with alcohol, in proportions of 2 to 2½ pounds per gallon, it leaves a bright film which is hard, durable and resistant to moisture. The Beacon Company.

WAX-B-E

A synthetic low-cost wax, which when emulsified, dries with a continuous bright non-tacky film. Emulsion can be combined with shellac or Shellak. Suggested uses, manufacture of bright-drying floor waxes and shoe polishes, rubber coatings, carbon papers, or for a general replacement for Carnauba Wax where an emulsion is to be made. The Beacon Company.

For your convenience in asking for more information on these products use coupon on page 573

COMPANIES WHOSE NEW PRODUCTS ARE DESCRIBED IN THIS ISSUE

American Cyanamid & Chemical Corporation
30 Rockefeller Plaza
New York, N.Y.

American Resinous Chemicals Corporation
103 Foster Street
Peabody, Mass.

American Wax Sales Corporation
P.O. Box A, Bergen Station
Jersey City, N.J.

Armour and Company
1355 West 31st Street
Chicago, Ill.

Atlas Powder Company
9th and Market Streets
Wilmington, Del.

Beacon Company, The
97 Bickford, Street
Boston, Mass.

Brocker Chemical Company
Morganville, N.J.

Carbide and Carbon Chemicals Corp.
30 East 42nd Street
New York, N.Y.

Coleer Pectin Company
10 West 47th Street
New York, N.Y.

Commercial Solvents Corporation
17 East 42nd Street
New York, N.Y.

Cowles Detergent Company, The
7016 Euclid Avenue
Cleveland, Ohio

du Pont de Nemours & Company, Inc., E. I.
Wilmington, Del.

Edcan Laboratories
10-20 Pine Street
South Norwalk, Conn.

Edwal Laboratories, Inc., The
732 Federal Street
Chicago, Ill.

Emulsol Corporation, The
59 East Madison Street
Chicago, Ill.

Greeff & Company, Inc., R. W.
10 Rockefeller Plaza
New York, N.Y.

Glyco Products Company, Inc.
230 King Street
Brooklyn, N.Y.

Heyden Chemical Corporation
50 Union Square
New York, N.Y.

Innis, Speiden & Company
117 Liberty Street
New York, N.Y.

King Laboratories, Inc.
205 Oneida Street
Syracuse, N.Y.

Metal and Thermit Corporation
Rahway and Randolph Aves.
Woodbridge, N.J.

Monsanto Chemical Company
1700 South 2nd Street
St. Louis, Mo.

National Aniline Division,
Allied Chemical & Dye Corp.
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New York, N.Y.

Neville Company, The
Neville Island
Pittsburgh, Penna.

Newport Industries, Inc.
230 Park Avenue
New York, N.Y.

Organic Products Company
512 Greenwich Street
New York, N.Y.

Pennsylvania Salt Manufacturing Co.
1000 Widener Building
Philadelphia, Pa.

Philadelphia Quartz Company
121 South Third Street
Philadelphia, Pa.

Rare Chemicals Research
52 Davenport Street
Stamford, Conn.

Sharples Chemicals, Inc.
23rd and Westmoreland Streets
Philadelphia, Penna.

Shell Development Company
4560 Horton Street
Emeryville, Calif.

Solvay Process Company, Inc.
40 Rector Street
New York, N.Y.

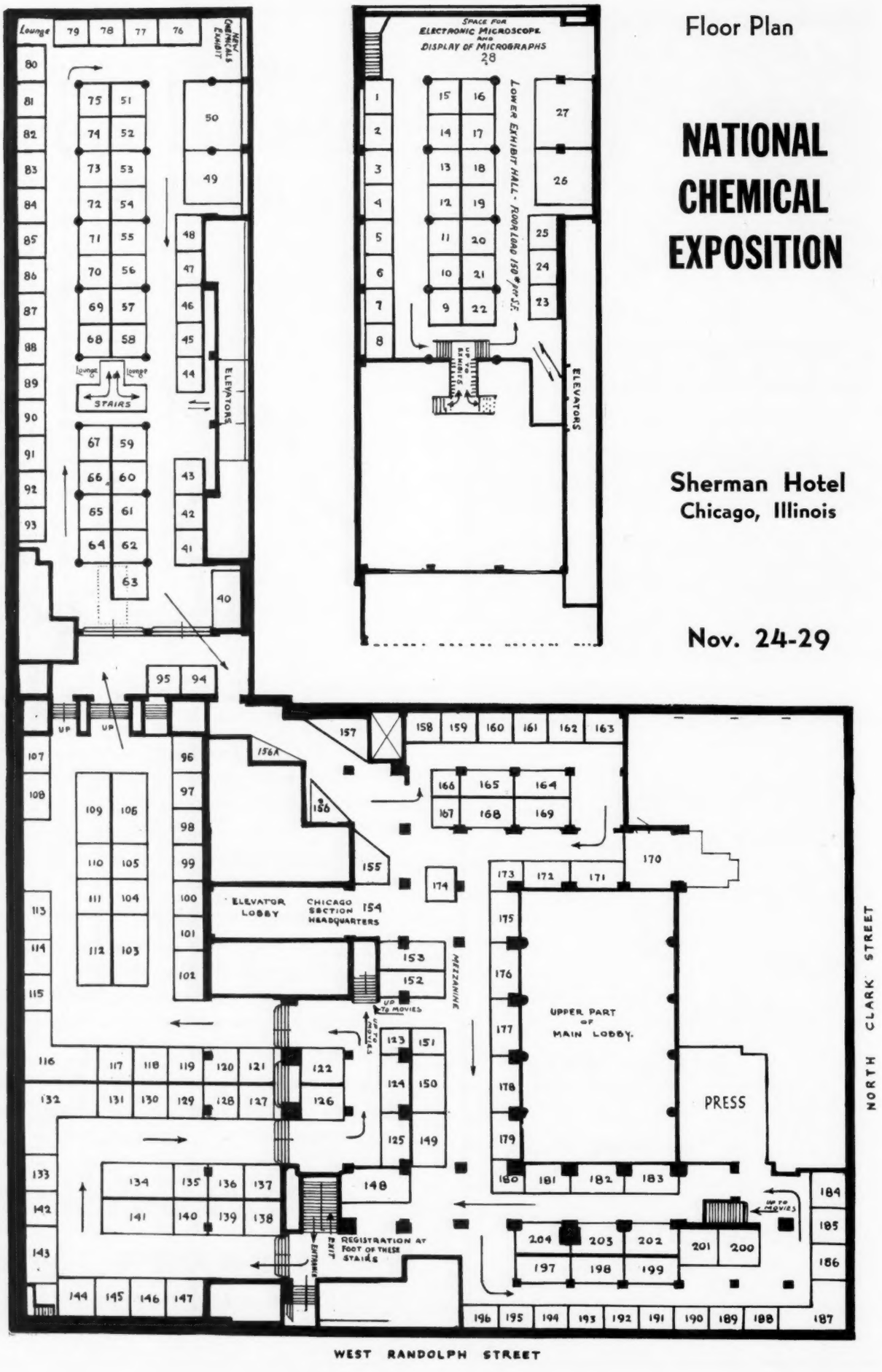
Texas Gulf Sulphur Company
75 East 45th Street
New York, N.Y.

Welch, Holme & Clark Company, Inc.
563-565 Greenwich Street
New York, N.Y.

West Virginia Pulp & Paper Company
230 Park Avenue
New York, N.Y.

Wishnick-Tumpeer, Inc.
295 Madison Avenue
New York, N.Y.

Wolf & Company, Jacques
Passaic, N.J.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Chicago, Illinois
Nov. 24-29
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FOREIGN LITERATURE DIGEST

By T. E. R. Singer

BOLETIM DO CONSELHO FEDERAL DE COMERCIO EXTERIOR. Vol. V, No. 11 Rio de Janeiro (1942), p. 47.

Exportation of Tungsten from 1937 through 1941: Tungsten is used to increase the hardness of steels, and on a smaller scale in the filaments of electric lamps and in chemical products.

About 70% of the mineral is mined in Asia, 10% in Latin America and the rest in Europe, United States, Australia and Africa. The exportation from Latin America, largely from Bolivia and Argentina, was 11.5% of the total world production in 1929 and 10.7% in 1938. Two tungsten deposits are known in Brazil at present, that of Encruzilhada in the state of South Rio Grande, and that of Mariana, in the state of Minas Gerais. It is expected that there will be a considerable development in the production of the deposit in South Rio Grande when the road which connects this mine with Encruzilhada will be completed. At Mariana the tungsten is obtained as a by-product, from scheelite, and gold is the chief product.

Prior to 1914-18 Brazil exported some wolframite to Germany. In later years the shipments were more regular.

Previously, practically all of South America's tungsten exports went to Europe. The total of these shipments was equal to the quantity imported by the United States as a supplement to its own production. It is therefore obvious that the requirements of the North American market could be filled by the countries of this hemisphere.

Brazilian Exportation of Tungsten (mineral) from 1937 through 1941

Countries	*Unit*	1937	1938	1939	1940	1941
United States	Kg.	....	1,000	....	10,000	.....
	Mil reis	....	7,715	....	149,945	.....
Germany	Kg.	....	1,090	7,900	....	.....
	Mil reis	....	3,882	65,379	....	.....
Belgium	Kg.	5,531	....	....	....	.....
	Mil reis	41,985	....	....	....	.....
Holland	Kg.	1,150	....	....	....	.....
	Mil reis	22,697	....	....	....	.....
Japan	Kg.	....	....	....	....	32,460
	Mil reis	....	....	....	....	1,175,908
Total	Kg.	6,681	2,090	7,900	10,000	32,460
	Mil reis	64,682	11,597	65,379	149,945	1,175,908

INSTITUTO NACIONAL DE TECNOLOGIA, Rio de Janeiro (1941). Booklet No. 73. Determination of Phosphorus by the Lorenz Method.

The National Institute of Technology of Rio de Janeiro has published a 35-page pamphlet on the determination of phosphorus by the method of N.v. Lorenz, involving the precipitation of phosphorus as ammonium phosphomolybdate. Although the determination of phosphorus in this form has many advantages, it is an extremely delicate process and depends on a great number of factors, such as the concentration of the reagents, the temperature at which the precipitation takes place, the concentration of the phosphorus in the solution, the impurities present, etc. The classical Treadwell method for determining phosphorus in this manner is described and discussed in detail. A few other methods are also given.

The Lorenz method differs in that the solution to be precipitated and the reagents used are prepared in a special manner. Its advantages are as follows: 1) The simplicity of the precipitating technique; 2) the phosphorus can be determined in a nitric, sulfuric, acetic or citric medium whereas in the other methods it can only be determined in a nitric medium; 3) the phosphorus can be determined in the presence of relatively large quantities of impurities, particularly iron, silicon and chlorine, which are detrimental to the other methods.

One chapter deals with the application of this process for calcium phosphates, superphosphates and fertilizers in general. Another chapter is devoted to the application of this method for iron and manganese minerals and pig irons.

CHEMICAL ENGINEERING, Volume 34, July 10, 1942, pp. 306-307 (Melbourne, Australia).

REFINING GOLD PRECIPITATE CONTAINING COPPER, Alex. Fraser, Metallurgist, Youanmi Gold Mines Ltd., W. A.

The Youanmi Gold Mines at Central Murchison, Western Australia, a precipitate containing 35 to 42% copper, and smaller percentages of antimony and arsenic has been handled for several years, and the bullion produced has seldom assayed below 800 fineness. Instead of smelting to produce a base alloy the method devised by Fraser was to include 12 to 14% of sulfur in the retort charge to change the base metal into matte in the preliminary smelt. In order to remove the zinc the wet Merrill Crowe precipitate was covered with water and agitated for 10 hours in a lead-lined tank with 40% of its weight of commercial sulfuric acid or in sufficient quantity to ensure that the pulp liquor remains slightly acid after treatment. After diluting the precipitate pulp with water to about six volumes it was settled overnight, decanted and filter-pressed. The precipitate cake from the press was almost dried in a small reverberatory wood furnace, but not to the dusting stage, then mixed with 50% soda ash, 45% borax glass, 30% sand and 12 to 15% sulfur before being charged into the tilting retort furnaces, fired by crude oil and air blast. To prevent an undesirable copper arsenide speiss from forming and to ensure the matte being partly iron sulfide, about 1 lb. of scrap iron shavings was stirred into the molten mass one-quarter hour before pouring. At the completion of the precipitate smelt the accumulated matte pieces were charged into one of the retorts which would hold up to 500 lb. of this heavy material and pieces of the thinnest sheet scrap iron, such as crumpled borax and zinc dust containers to the extent of 6 to 8% were stirred gradually into the molten bullion. The resulting bullion ingot, of a fineness usually between 300 and 400 fine, was remelted and refined by stirring into it successive charges of stick sulfur, with the retort conveniently inclined, until its fineness was improved to that of the bullion from the precipitate smelt. The method hinges on the successful regulation of the sulfur and iron added to combine with the base metal present.

Ibid. page 308. The annual report for 1941 of the Chamber of Mines of Western Australia shows a general decrease in the tonnage of ore treated, the gold yield therefrom, and the number of men employed in the industry.

The price of gold decreased during the year by 4 s. per fine oz., or 2 s. per fine oz. after deduction of Commonwealth gold tax. The average price during the period was £10.13.8.28 per fine ounce, and the average price after deduction of Commonwealth government gold tax of 50% of the amount by which the price paid by the Commonwealth Bank exceeds £9 per fine ounce was £9.16.10.14 per fine ounce.

Can you answer these questions?

1. **What important raw materials do we lack?**
2. **Is it possible for us to get them? Where?**
3. **What "civilian goods" will disappear from the market?**
4. **What substitutes are available for lost civilian goods?**
5. **What can the individual do to counteract shortages?**
6. **What do battles for far-flung territories mean to us?**
7. **What is the true rubber situation?**
8. **Will there be synthetic rubber tires for civilians? When?**
9. **Will civilian tires disappear for the duration?**
10. **What about tin? Canned goods?**
11. **How does petroleum affect the war?**
12. **What is our biggest weapon against the axis?**

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As they have done with a similar problem in *Chemistry In Warfare*, the Hessels undertake to analyze and describe strategic materials for the average man, telling about the shortages, the available substitutes, effects on consumer goods and prices, and the effect of these vital supplies on the outcome of the war. They have collaborated with Walter J. Murphy, editor of *Chemical Industries*, to produce a volume which should be read by every wide-awake citizen who wishes to understand what the war is about, what sacrifices he must make, and wherein lies our strength. Visual diagrams make a complex subject crystal clear and contribute to a challenging and understandable analysis.

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CHEMICAL SPECIALTY COMPANY NEWS

Soap Speeds Production; Fights Insect Pests

THE ability of soap to produce suspensions in water is more or less familiar to everyone. Yet how many know the vital part that such suspensions, of bitumen, waxes, rubber, artificial resins and the like, are playing in the modern industry under the stress of war production.

Of definite importance in large scale industrial and war work is a revolutionary type of paint recently developed, which consists essentially of a suspension of synthetic resins and pigment in soapy water. This paint is non-inflammable, quick drying, and eliminates noxious vapors. Resin emulsion paints are now being used to camouflage gun emplacements, munitions depots, and large war plants. The dull finish for many army vehicles is supplied by emulsion paints.

Soap is applied to other war problems in a modern method for the preparation of building blocks from clayey soil and a bitumen emulsion. (U. S. Pat. 2,275,087) Large numbers of field structures must be put up quickly in modern warfare, and any method which eases the strain on transportation facilities is of obvious value. In this new process only a portable mixer-extruder and a small amount of soap bitumen emulsion need be transported. The main component of the blocks can usually be obtained from the ground around the building area. Another advantage is that the blocks dry within twenty-four hours, so that fast construction with little storage space is possible.

Asphaltic emulsions will also help alleviate the rubber tire shortage when the new "wrap-around" substitutes are ready for sale. These consist essentially of a heavy rug-like cloth coated with an asphalt emulsion, which can literally be wrapped around the worn-out tires. While the mileage obtainable from these coatings is not great in comparison with rubber treads it is reported that their use is justified by their low cost.

Crop-growers and herd-raisers have long ago found soap a useful weapon for the destruction of their greatest enemies, the insects. Destruction caused by insects can be measured in hundreds of millions of dollars. In the battle to stop this astounding loss soap is one of the most useful weapons.

Soap is often used with other ingredients to help wet the vegetation and thus permit spreading of the mixture. In many insecticides, the soap also is used to emulsify a toxic chemical in water. A recently granted patent (Australian Pat. 114,590) describes such a preparation, which is to be used for treating animals. The toxic substance is the phenolic fraction from the destructive distillation of grass tree resin, dissolved in a petroleum oil fraction like kerosene, and emulsified in water with soap.

Another insecticide described recently (Jap. Pat. 129,411) is made by adding rotenone, pyrethrolone, or arsenic compounds to a neutral aqueous or alcoholic solution of lecithin and soft soap. Sodium oleate soap, as researches have shown, definitely increases the efficiency of nicotine sprays.

Announce Research Results

New research contributions that have a direct bearing on the war emergency and adjustments in the research program to meet defense needs are stressed in the sixty-first annual report of the State Experiment Station at Geneva which has just come from the press.

Some of the definite accomplishments cited include the development of new types of insecticides and fungicides that release vital metals for the war effort, such as copper, mercury, and sulfur. Recent work also points the way to more economical use of oils for sprays and improvements in the preservation of fruit and vegetable juices. Brief summaries of the research work of the eight research divisions at the station are included in the report which may be obtained upon request.

Clorox Elects Officers

Clorox Chemical Co. stockholders at a meeting last month in San Francisco re-elected all officers and members of the board of directors.

Officers are: Robert Dalziel, chairman of the board; W. J. Roth, president; B. J. Feigenbaum, vice-president and general counsel; T. E. Fullmer, vice-president; W. L. Wolford, secretary-treasurer; Earl M. Matson, assistant secretary and treasurer.

New Dehydrated Paint

A new type of paint was introduced by Devoe & Raynolds Co. this month, a completely dehydrated paint called "Dehydray." Development of this new product, which weighs about half as much as liquid paint and which bulks considerably less, is in line with the government's effort to cut down on freight space to make more room for shipment of vital war materials.

The new paint, which is made primarily for consumer use, is available in 12 standard colors. A chart shows 12 additional colors which may be obtained by intermixing two or more of the standard colors.

NPCA to Meet

Tenth annual convention of the National Pest Control Association will be held Oct. 26, 27 and 28 at the Hotel William Penn, Pittsburgh, Pa. Theme of the convention will be "Pest Control—A Wartime Necessity."

Lucas Gets Award

John Lucas & Co., Philadelphia paint manufacturer, has been awarded the Maritime Eagle for excellence in production of supplies for the merchant marine.

New Plastic Cork Coating

J. W. Mortell Co., Kankakee, Ill., recently introduced NoDrip, an improved plastic cork coating that stops dripping from condensation or sweating pipes, walls, ceilings, tanks, etc.

The first product of this kind introduced by this company for the same purpose was more limited in its use to large areas because it required power spray equipment

to apply it, but NoDrip has a greatly enlarged field, not only in industry but in the home and on farms, due to its easier and quicker method of application by using an ordinary paint brush.

NoDrip is spread ¼" thick over any metal, concrete, brick, plaster, tile, wood, composition, galvanized or painted surfaces, corners, angles or corrugated ceilings. It can be painted any color.

CANADIAN REVIEW

By Kenneth R. Wilson

OTTAWA — Canada, has had nearly a month in which to test the effects of the drastic job control regulations which Director of National Selective Service, Elliott M. Little put into effect on Sept. 1. The experience of employers in regard to these laws and the additional restrictive controls which are clearly ahead in Canada, point the way to what is almost sure to happen in the United States as manpower shortages get more acute.

I asked Mr. Little a few days ago how closely Canada was working with the United States in the matter of manpower controls. He said: "We've had conversations, of course, and a round table conference in Montreal recently when some of the U. S. officials came up to see our system at work." But he added:

K. R. Wilson

"The fact is that our manpower problem is much more acute than in the United States. Our so-called "pool" of unemployed is now as low as 25,000 or 30,000—lower than at any time in national history. In the United States there are still many millions of unemployed to draw from. "What we have done is to borrow one of the ablest men in the British Labor and Selective Service offices. He is here now helping us to put our plan on the rails. It is Britain which has pointed the way in this thing and we are going to save a lot of headaches and get our machinery working a lot easier and faster by drawing heavily on British experience."

Here, in brief, are the new manpower controls which affect all employers and employees in Canada:

1. No employer may dismiss any worker and no worker may quit any job without giving seven days' notice in writing of that intention.
2. No person may seek employment and no employer may hire or interview with intent to hire, any person, man or woman, unless the person has a permit to seek employment.

   (Certain exceptions are made from the above two orders for such types as casual labor, professional engineers, teachers, provincial government employees, etc.)
3. Without any exception no one capable of working may remain voluntarily unemployed. Anyone, not working full-time for a period of two weeks or more, can be ordered to take full-time suitable work.
4. All employers must report their future labor needs to Employment and Selective Service offices, and must fill their current needs through the same offices.

All employers must give a notice of separation when workers leave their employment. This notice must be presented at the Employment and Selective Service office where the worker receives a permit to seek work. This permit may restrict the worker to seek employment in a given locality, industry, occupation or establishment. Without a permit no one in Canada may now seek work or be hired.

Obviously, the purpose of these controls is to cut down labor turnover and give manpower authorities a check on the movement, supply of and demand for labor. But there has been one curious but very important result in terms of business costs. Under the new regulations a man can no longer be laid off without notice. His wages continue at least seven days, if no work is available. That means he can't be laid off every time a machine breaks down.

This hits employers who figure their costs on a no-pay-for idleness basis, right between the eyes—especially when selling prices are frozen as under the Canadian price ceiling. If the flow of materials through the plant is held up for any reason, if power is cut off due to industry overload, or if any part of the plant has to shut down, every man must be paid. So far, selective service officials say this is the price that must be paid if labor movement is to be checked but it is a new and quite unexpected wrinkle in manpower control which employers never thought of until the law was put into effect.

Canadian employers are also finding out that this type of manpower control means an immediate and inevitable lowering in the quality of men and women available for filling jobs. As Director Little puts it:

"Employers are finding out that there are no more red apples in the basket. They have got to be satisfied with green. If we have 1800 men available for work in a town and there are about 1800 jobs to fill, we won't let any new workers come into that community until the 1800 unemployed are given jobs. That means that every employer will have to do a lot of shuffling within his organization so as to make use of what help is available, rather than wait until he can get the sort of person he thinks he needs."

Another important lesson which Canada is learning is the importance of bringing all manpower controls under one authority. Up till now the draft machinery, the employment offices, and civilian selective service have been under different administration in Canada. Now these are all being brought under National Selective Service with Director Little in charge. Canadian experience has shown that the other plan did not make for most effective channelling and use of manpower once the need became really acute.

And it it this lengthening shadow of an acute manpower shortage which now threatens to completely transform business operations in Canada in the near future. What is clearly in prospect is the wholesale and possibly ruthless curtailment of non-essential Canadian civilian industry within the next six to 20 months.

The job of organizing and putting this policy into effect, has been handed over to Canada's price ceiling authorities—the Wartime Prices and Trade Board. Where major industries are affected such as pulp and paper, gold mines, etc., representative labor-management advisory committees are being set up to give advice on how the job is to be done.

But Canada has learned at least one important lesson from British experience, namely: that it's no use ordering an industry to slit its own throat. It will be the WPTB which will do the ordering although each industry or manufacturer will be given every possible opportunity to show ways and means of making the throat-slitting less painful.

Fate of Non-Essentials

In some instances whole industries will be ordered to stop production of non-essential lines for the duration of the war. In other cases production will be concentrated in individual areas or plants, and a standard or "victory" type of merchandise produced. In the case of essential goods this will lead to nationwide rationing on a far bigger scale than anything now envisaged.

Up till now, most of the stoppage in civilian goods has been due to shortage of materials. The job of the Prices Administration has been to encourage industry to cut costs and produce as much merchandise as possible with the available materials without breaking the price ceiling. Now that the emphasis is on saving manpower, the picture is reversed and it will be the new purpose to produce as little of civilian non-essentials as pos-

(*Continued on page 639*)

MARKETS IN REVIEW

By Paul B. Slawter, Jr.

Heavy Chemicals — Fine Chemicals — Coal Tar Chemicals — Raw Materials — Agricultural Chemicals — Pigments and Solvents

THE government last month characterized the chemical industry as "in the very heart of war production, particularly in munitions manufacture" and gave chemical producers new higher preference ratings to enable them to obtain maintenance repair and operating supplies. It is essential, the order read, that impairment of production and breakdowns be avoided.

This move was in the form of an amendment to Preference Rating Order P-89 which was originally issued to provide chemical producers with preference ratings high enough to insure their getting immediate delivery of supplies to avoid or repair breakdowns. The order has been amended several times (this is the third) to increase the ratings assigned as supplies became more difficult to get. This ought to show you where your industry stands in this war business.

Importers and exporters in N. Y. City met this month at a mass meeting sponsored by the Commerce and Industry Association and urged appointment of a "czar" with over-all control of foreign trade activities during the present emergency. Most of their complaints were aimed at the administration of the Board of Economic Warfare. The following examples of conditions requiring correction were cited:

1. Needless waste of time, money and materials by the agency which has "completely dirsegarded the cost of compliance" with its regulations.
2. Delays in obtaining export licenses, which, it was asserted, now require an average period of twenty-one days for processing.
3. Rejection of license applications because of the shipping situation, although it is "impossible" for BEW to make an accurate forecast on the situation when the goods are ready for shipment.
4. Shipments of spare parts and stock merchandise are now rejected although the lack of such supplies in foreign countries creates dissatisfaction with American equipment and manufacturers.
5. Excessive statistical data are required.
6. Name of ultimate consumer is demanded on applications, although this is "obviously impossible for the exporter."
7. Because of delays in obtaining shipping space the present six-month validity of licenses "is too short" to permit shipment of many orders.
8. The system of allocating materials to Latin-American countries needs to be "extended and made operative on an efficient basis."
9. With expenses incident to shipping rising, the Office of Price Administration should recognize the cost and risk to the shipper of the increased outlays by permitting the charge of a reasonable commission on all such outlays as are incurred for the account of the buyer.
10. The present ten days to two weeks, which is the minimum time required for permits from the Office of Defense Transportation, creates an accumulation of goods at the manufacturers' warehouses, much of which could be avoided by prompt issuance of permits.
11. Government war-risk insurance should be extended to provide open policies for exporters.
12. Lend-lease sales should not be considered as domestic transactions.
13. Importers are "handicapped by lack of definiteness in statements issued by the government concerning import controls."
14. To the extent that it is feasible, shipping which has been diverted to the Port of New York should be returned.

Government in the last month did a lot of things which affect the chemical industry in one way or another. Formation of 12 industry advisory committees,—abrasives, fluorspar mining, vinyl resins producers and baking powder industries among those represented—was announced Sept. 26. A three-man board, known as the War Department Board of Contract Appeals, was established in the Office of Under Secretary of War Robert P. Patterson for just that purpose. An operating staff for the Referee Board of the Chemicals Branch of the WPB was announced by Dr. Donald B. Keyes, chairman, its purpose to collect data on various problems for submission to the board and make preliminary reports. A War Liabilities Adjustment Board was appointed to facilitate the use of all productive facilities during the war and to assure small businesses the opportunity to reenter a competitive economy after the war ends.

Among the official orders affecting prices and priorities were: revision of copper chemicals order to permit farmers to obtain materials for soil treatment, insecticides and fungicides; specific dollars and cents ceilings were established for soy bean, corn and peanut oils; unlimited use of nitrogen bearing fertilizer by Army, Navy or Coast Guard on new airports and airfields was permitted; producers of silver salts were allowed upward adjustment of maximum prices; revisions in price regulations for industrial solvents were established with ceilings of 14.25 cents per pound for normal butyl alcohol, 7 cents a pound for fermentation alcohol and 14.75 cents a pound for normal fermentation butyl acetate (tanks, Eastern territory); sulfamic acid was placed under complete allocation control; vinyl acetate was placed under complete allocation control; and temporary exemption of saw or veneer millwood waste from price control was made permanent.

Heavy Chemicals: An extensive program of research is now being carried out by Battelle Memorial Institute on the treatment of coal with calcium chloride to reduce dust in handling and to avoid difficulty with the freezing of wet coal. It's under the joint sponsorship of the Calcium Chloride Association and Bituminous Coal Research, Inc., at the Columbus, Ohio Institute. . . . The rubber crisis, the Association of American Soap & Glycerine Producers tells us, will call for the annual use of 100,000,000 pounds of soap. Everywhere in the heavy chemical market the non-essential lines show decreasing volume. Bleaching powder manufacturers are trying hard to keep up with the demand for this product. WPB has not yet released October shipments of copper chemicals covered by M-227. Don't forget that material required for November calls for filing form PD-600 with WPB. (Orders for agricultural use do not require this form.) Chlorine, aqua ammonia, ammonium carbonate and methyl ethyl ketone are extremely difficult to obtain. Alkali manufacturers are booking contracts for delivery over the coming year. Carbon tetrachloride business, we hear, is being accepted for next year at current quotations. Most 1943 price schedules should be at about the same prices, it is rumored. One company's price schedule just released on soda ash, caustic soda and chlorine shows no changes in price schedules currently effective.

Synthetic Organic Chemicals: This reporter is addicted to making predictions about the chemical industry. This month you are getting an exclusive prediction and you can do with it what you will. If it comes true you will thank me; if not I'll apologize. Viz., i.e.,—that branch of chemistry known as the aliphatic branch will one day become king of chemistry. It's a branch that will bear

watching. It's a branch you may want to expand your interest in.

In case you don't know or just can't remember, an aliphatic compound is any organic compound that contains an open chain of carbon atoms, whether normal or forked saturated or unsaturated. This word had its origin in the relation of some of the earlier known organic compounds to the natural fats (Gr. aleiphatos, oil or fat). It is now used as a convenient general term to differentiate all open-chain compounds from those which contain closed chains or rings of carbon atoms. J. N. Taylor, Chief of the Organic Chemical Section and Auditing Chief of the Chemicals Staff, Division of Industrial Economy, Bureau of Foreign and Domest'c Commerce, has an article in the Sept. 28 issue of the Domestic Commerce Weekly which tells of the progress of this branch of the industry. His article is called "A Quarter-Century of Synthetic Organic Chemical Development." It's one you shouldn't miss. In 1941, for instance, the manufacture of aliphatics totaled 5,009,000,000 pounds, more than six times as much as the 772,000,000 pounds made in 1933.

The 1942 first half output of synthetic organic chemicals, he says in his article, far outstrips that in corresponding 1941 period. Difficulties in obtaining supplies of raw materials are admittedly being encountered; but there is no doubt that in the remainder of the year 1942 manufacture of synthetic organic chemicals will exceed all previous records, if judged by the current trends and by the industry's ability to "get out the goods."

Get yourself interested in this branch if you're not already connected with it.

Fine Chemicals: Caffeine and theobromine went under complete allocation control Oct. 1 by dint of a conservation order No. M-222. It will reduce the amounts of caffeine which can be made available for beverage production. Glycols, also, went under complete allocation Oct. 1 with the issuance of General Preference Order M-215. Fulfillment of requirements for the armed forces has created a shortage in the supply of glycols. Under the order this term applies to ethylene glycol, propylene glycol, diethylene glycol, triethylene glycol and physical mixtures of them. Silica gel is under complete allocation as of Oct. 1. Entire production of the nation's distilled spirits industry was diverted for war purposes Oct. 8. Approximately half the industry, by volume had been converted to making industrial alcohol since early in the year. The Oct. 8 action enlists the other half Combined output of the entire industry is expected to reach 240 million gallons of industrial alcohol a year. To aid the WPB in its effort to increase the production of high proof ethyl alcohol the OPA has issued a special pricing formula for whiskey distilleries.

The pricing formula contained in Amendment No. 2 to Revised Price Schedule No. 28, Ethyl Alcohol, is intended to provide relief to whiskey distilleries which have converted to the production of 188 proof or higher ethyl alcohol and whose costs of production during the initial stages of production may be abnormally high. This amendment effective Sept. 23, will give such converted distilleries the choice of selling industrial alcohol at the maximum prices prevailing or at the maximum prices computed pursuant to the formula contained in the amendment.

Maximum Price Regulation No. 28 establishes a maximum price of 50 cents per wine gallon for the basic SD-2B formula of ethyl alcohol of 188-190 proof. Maximum prices for formulas of ethyl alcohol not listed in Revised Price Schedule No. 28, including pure ethyl alcohol, have been established by the General Maximum Price Regulation at the March 1942 levels.

The pricing method contained in the amendment applies only to alcoholic beverage distilleries which did not sell ethyl alcohol of 188 proof or higher exclusively prior to July 1, 1942, and covers only sales made to the Defense Supplies Corp.

Simultaneously, sales of ethyl alcohol of 188 proof or higher, commonly known as industrial alcohol, by the Defense Supplies Corp. to the government, its agencies or any person using the alcohol to fulfill

a government contract are exempt from the provisions of Revised Price Schedule No. 28, the specific regulation governing certain formulas of the product, and from the GMPR.

Exemption of the product from specific price regulation when sold by the Defense Supplies Corporation is desirable since the OPA wishes to establish an average resale price covering all industrial alcohol allocated for war needs. This resale price is to be based upon the average cost of the ethyl alcohol to the Defense Supplies Corp. The exemption is made in Amendment No. 3 to Revised Price Schedule No. 28 Ethyl Alcohol, and is effective Sept. 23.

Natural Raw Materials: Department of Agriculture has received authorization from the House to increase plantings of guayule rubber from 75,000 to 500,000 acres. Senate action is awaited. War Production Board has imposed limitations on the uses of fats and oils as a move to build up a reserve supply of the commodities for war requirements. The Bureau of Economic Warfare's office of exports is requiring exporters to apply for individual licenses to cover edible fat and oils; inedible fats and oils; nuts, vegetable oils and fats; oilseeds; naval stores gums and resins; and chemical specialties.

Importers of vegetable fats and oils have been notified of a revision in the schedule of commodities and consideration days under which the Commodity Credit Corp. considers offers submitted to sell fats, oils and oil-bearing materials for importation under supervision of WPB General Imports Order M-63. The revised schedule changes consideration days for offers from a Monday-Wednesday-Friday basis to Tuesdays and Fridays only. On either of these two days, CCC will consider offers of commodities listed below, if received by 4 P. M. EWT, by the Director of Foreign Purchases, Commodity Credit Corp., U. S. Department of Agriculture, Washington, D. C.

Babassu oil, babassu kernels, cashew nut shell oil, castor oil, castor seed, coconut oil, copra, muru muru oil, neatsfoot oil, ouricury oil, oiticica oil, palm kernels, palm kernel oil, palm oil, rapeseed oil, and tucum oil.

An agreement by the United States and Great Britain for partition of world areas in which each will exclusively buy fats, oils and oil seeds for all United Nations' use was announced recently by the Combined Food Board composed of representatives of the two countries.

The plan of coordinate purchase and allocation has been accepted by the food authorities of the United States, the United Kingdom, Canada, Australia, New Zealand and South Africa, and is now in effect, the food board said.

With the government stockpile of gum spirits turpentine now approaching 100,000 barrels, or almost one-third of the total expected production of this naval stores year of 1942-43, with 65 cents offered by the government for all eligible gum spirits turpentine produced in the remainder of this year, with the dealers carrying very modest stocks of this commodity, with the additional offerings available to them from which to replenish their supplies growing more and more limited, with less than 30 per cent of this year's production, i.e., ending March 31st next, to come to market, it is easy to understand why gum spirits turpentine has been hovering around the 65 cent stockpile price, with the market expected to become at least stabilized on that basis before long, if it does not advance beyond 65 cents.

For this September the average price was 60½c. For the six months April-September the average price wsa 57¼c.

For the year ending March 31, 1943, the average price will probably be around 61 cents.

This year the average price will be the highest average price since the year 1926-27, when the lowest quotation of the year at Savannah was 60½c and the highest 96½c.

That year was the end of a period of eight years of phenomenal values for turpentine, following the World War No. 1.

It is interesting, in view of what may occur with regard to spirits turpentine in the coming months and in the next naval stores year or two, to note what happened in that period of 1919-20 to 1926-27, inclusive.

In bulk the prices would be approximately 6 cents a gallon less.

This rapid upward movement in gum spirits turpentine quotations was the direct result of a decrease in the crop of 1918-19 to 340.000 barrels, followed in 1919-20 by only 400,000 barrels.

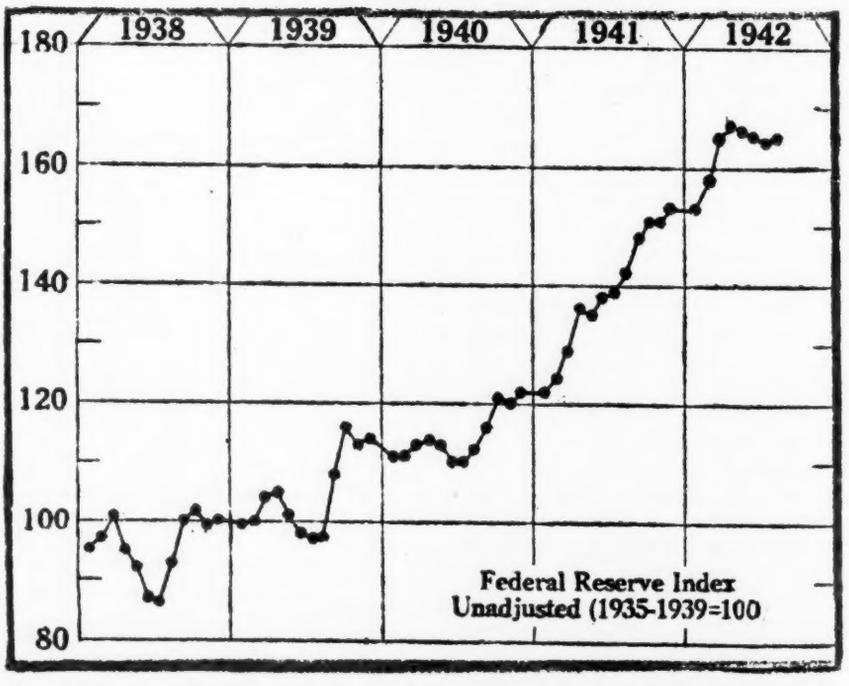
The production in 1918-19 proved the smallest in many years, but the crop of last year, 285,000 barrels, followed this year by an estimated production of 325,000 barrels, established new low records of probably a half-century.

What is now taking place, and what is apt to take place with regard to spirits turpentine, is due as much to the reduction in available supplies as to other causes, backed, of course, by the government's loan policy, and by its stockpile policy, effective June 22, 1942, which gave an immediate boost to prices that would have come eventually, in all probability, as the effects of reduced supplies became more apparent.

Read "New Products & Processes" column this month for details on a process to increase yield in this industry.

Fertilizer Materials: Important changes are taking place with respect to the wartime supply of commercial fertilizers that have so long been the mainstay of southern agriculture. While the supplies of such basic fertilizer materials as potash, phosphate rock, and sulfur are

Chemical Production



Federal Reserve Board's unadjusted index of chemical production stood at 165 for August. Revised July figure turns out to be 165, too, compared with 142 for same month a year ago. Conversion to war work has forced the chemical industry to cut down on output to civilian sources and production in war materials field is just beginning to take up the slack in some fields.

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U.S.I. CHEMICAL NEWS

October ★ A Monthly Series for Chemists and Executives of the Solvents and Chemical Consuming Industries ★ 1942

Improves Qualities Of Yellow Pigments By Heat Treatment

Transparency and Tinctorial Strength Materially Increased

WOODSTOWN, N. J.—Possibility that the well-known high transparency and excellent tinctorial strength of the yellow pigments, formed by coupling the acetoacetarylides with other compounds, can be still further increased is suggested by a recent patent granted to an inventor here.

Describing the results obtained with a yellow pigment produced by coupling tetrazotized 3, 3'-dichlorbenzidine with acetoacetanilide, the inventor claims that the transparency was greatly increased by a suitable heat treatment of the precipitated color before isolating it. The process is expected to increase the utility of this yellow pigment for printing inks.

Acetoacetanilide is produced by U.S.I.

Describes Novel Shampoo For Use Without Water

BROOKLYN, N. Y.—A soapless hair shampoo which forms a cleansing and dirt-loosening foam or froth, without the addition of water at the time of using, can be prepared by dissolving a frothing agent in an aqueous-ethanol mixture.

This claim is made by an inventor here, who has obtained a patent on the shampoo. The preparation, according to the inventor, carries away dirt, oil, and foreign matter largely by the flotation action of the froth. For this reason, it is desirable to use a relatively high concentration of the frothing agent. This is made possible, the inventor points out, by the use of the aqueous-ethanol mixture, which has higher solvent power for the frothing agent than water alone. A preferred composition also includes buffer salts to act as mineralizers and pH regulators for the froth.

A bulletin recently issued by U.S.I. outlines procedures for separating and analyzing the volatile constituents of lacquers. Copies are available free of charge — ask for Bulletin SA.

Suggest New Formula For Paint and Varnish Remover

WASHINGTON, D. C.—An efficient paint and varnish remover, which has shown satisfactory results in tests, can be formulated without the aid of benzol, it has been reported here.

The product is said to be a mixture of 25% by-product chlorinated hydrocarbon, 50% acetone, and 25% denatured alcohol. A small amount of wax (2 to 3%) is added to the mixture. The by-product chlorinated hydrocarbon used is described as a mixture of the chlorides of methane, propane, and ethane.

This paint remover is said to have been successfully tested on floor finishes two years old, exterior paints, and synthetic enamel films one year old.

New Method Devised to Study Drying Rates of Lacquer Films

Procedure Simulates Actual Drying Conditions of Protective Coatings, Permits Accurate Determinations in a Short Time

A simple, rapid technique for determining the drying rates of thin films by means of an easily constructed apparatus was recently devised by George Rieger and C. S. Grove, Jr., at the University of Minnesota. The procedure, which may be expected to give new light on the behavior of film-forming solutions, such as are used in protective coatings, has the special advantage of simulating the drying conditions encountered in practical applications, it is reported. Hence the data which can be obtained should be particularly valuable to lacquer formulators.

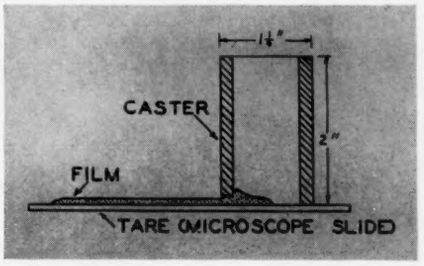

Fig. 1. Film is cast on a glass slide by means of a brass tube, carefully machined and channel-cut at one end.

Fundamentally, the procedure consists in observing the changes in weight of a thin film cast on a glass slide used as a base or tare. The film caster is made from a length of brass tubing. One end of the tubing is machined, and a casting channel is milled out. (See Fig. 1 at left.) A few milliliters of the solution to be tested are introduced inside the caster, which is then moved over the surface of the tare to cast the film. Excess solution is thrown clear of the tare and may be caught in a suitable container.

Test Apparatus

Since the weight of the tare is large compared to the weight of the film, determination of the rate of drying requires an extremely sensitive weighing device. For this purpose, Mr. Rieger and Dr. Grove have employed a Christian Becker air-damped analytical balance, which is provided with a scale attached to a pointer, and ordinarily read by means of a microscope. To simplify the taking of readings, lenses and a source of light are so arranged that the pointer scale can be projected on a screen. (See Fig. 2 below.)

Recording of Values

With this apparatus, the weight of the tare and film is determined and recorded at equally spaced time intervals. At the conclusion of the drying run, the tare and film are removed and placed in a drying oven, then removed from the oven and allowed to stand overnight. This weight is then recorded as the "dry weight."

A series of simple calculations based on these readings gives the necessary data for

(*Continued on next page*)

Alcohols Identified by Conversion to Xanthates

WASHINGTON, D. C.—Alcohols, glycols, and glycol ethers can frequently be identified by a simple procedure involving their conversion to the corresponding potassium xanthates. The xanthates, it is pointed out, have definite melting points and easily determined iodine equivalents, thus making identification a fairly simple matter.

The procedure is described as consisting in treating an aqueous solution of the alcohol to be identified with potassium hydroxide, alcohol-free acetone, and alcohol-free carbon disulfide at a temperature of about 40°. In the case of the monohydroxy alcohols, the xanthates thus obtained are dissolved in acetone, precipitated with ether, redissolved in alcohol, and recrystallized by adding ether.

Melting point and iodine equivalent of the xanthate are then determined. The alcohol undergoing test is identified by comparing these values with known data.

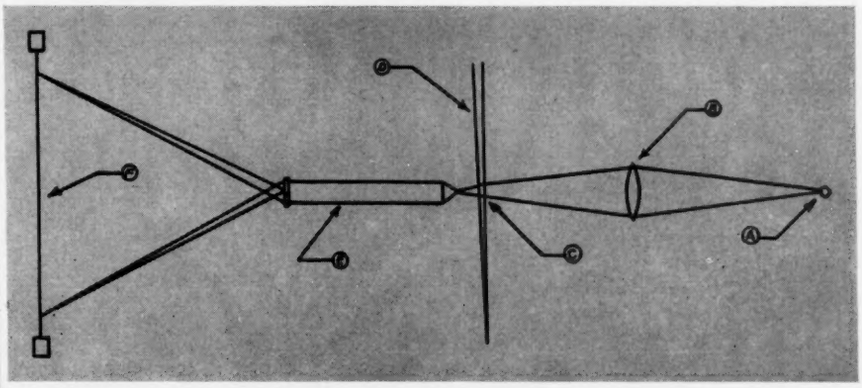

Fig. 2. Optical system for facilitating taking of weight readings during test runs. A, light source; B, condenser lens; C, pointer scale; D, pointer; E, balance lens; F, projection screen.

Drying Rates of Films Studied by New Method

(Continued from previous page)

constructing graphs of the drying rate. For any drying time T, the total weight W of tare and film is known. Subtracting from W the "dry weight" of the tare and film gives the weight of the volatiles V present in the film at time T. F, the grams of solvent per gram of dry film is then obtained by dividing V by the weight of the "dry" film. The area of the "dry" film in square inches A is determined by a planimeter.

Drying Rate Calculations

The drying rate R is expressed as milligrams of volatiles per square inch of "dry" film per minute. For practical purposes, if readings of W are taken at sufficiently short intervals of T, the drying rates may be calculated directly from the original data as follows:

$$R_2 = \frac{1000\ (W_3 - W_1)}{A\ (T_3 - T_1)} =$$

$$\frac{\text{mg.}}{\text{sq. in.—min.}} \text{ at } T_2 \text{ and } F_2,$$

where T_2 is midway between T_3 and T_1.

Reproducibility of Results

As a check on the reproducibility of results obtained by this method, Mr. Rieger and Dr. Grove made a number of duplicate runs on a 5% solution of 20 second nitrocellulose in ethyl acetate and plotted the R *vs.* F values. The results are shown in Fig. 3 in the adjoining column. It will be noted that the deviations of the points from the "best" curve drawn through them are small.

The method is described as particularly useful in studying the behavior of thin films of very rapidly drying solutions, while in the case of more slowly drying solutions it offers an opportunity to conduct a number of drying runs in the time formerly required for one. While most of the investigations already conducted with this apparatus have dealt with nitrocellulose solutions, the method is regarded as applicable to the study of the drying rates of any type of thin film, including those in which drying takes place by a combination of evaporation and chemical action. The simplicity and rapidity of the technique are expected to make it a valuable tool of research.

(U.S.I. CHEMICAL NEWS is indebted to Mr. Rieger, Dr. Grove, and the publishers of *Industrial and Engineering Chemistry* for permission to reproduce this material.)

Urethan to be Included In U.S.P. XII as Aid to Quinine Salt Solubility

Urethan (ethyl carbamate) will be included among the drugs to be listed in the new pharmacopoeia, U.S.P. XII, which will become effective November 1, it has been announced.

Urethan will be used in preparing injections of quinine hydrochloride and urethan, to increase the solubility of the quinine salt and to make a neutral solution, which is employed as a sclerosing solution in varicose veins.

Report Rapid Method for Sulfate Ion Determination

A rapid volumetric method, recently described, for the determination of sulfate ion, offers an interesting illustration of the application of ethanol as a non-solvent, in contrast to its more widespread use because of its excellent solvent powers.

The method involves the use of barium chloride and disodium hydrogen phosphate, with methyl red as an indicator. A concentration of at least 25% by volume of ethanol is said to be necessary to reduce the solubility of barium hydrogen phosphate sufficiently to give good results.

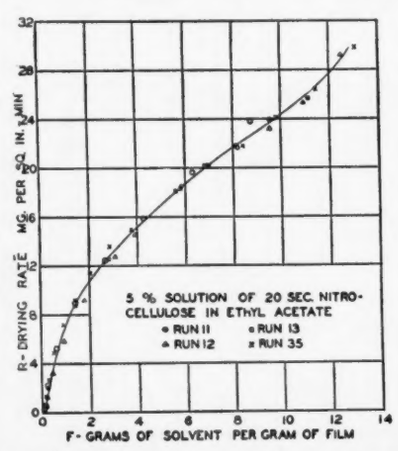

Fig. 3. Results of a group of test runs, undertaken to determine the reproducibility of results obtained by the method.

TECHNICAL DEVELOPMENTS

Further information on these items may be obtained by writing to U.S.I.

Colorimetric determinations of pH can now be carried out with less than 0.5 ml. of sample with the aid of a new test set, it is claimed. It is said that turbidity and color in sample do not interfere with determination. Standard range is from 5.2 to 8.6 pH, with accuracy of ±0.1. **(No. 620)**

U S I

Oil of Canada Fir is a new product described as having a fragrant, persistent odor of fir trees. Maker suggests its use in soaps, bath preparations, and similar products. Samples are said to be available. **(No. 621)**

U S I

A flame arrester for the protection of tanks containing volatile, flammable liquids is said to permit free passage of vapors, but to offer a positive stop against flame if the vapors become ignited. Arrester is described as being adaptable also to preventing the propagation of flame along a pipe line carrying explosive gases. **(No. 622)**

U S I

Phosphorescent tape is a new addition to the list of blackout products. Made in 1-inch width with an adhesive backing, it is suggested by the manufacturer for outlining of doors or obstructions, and for cutting into short lengths to make lettering. Activation may be by natural or artificial light. **(No. 623)**

U S I

A water-white liquid is said to be useful in removing paint, enamel, lacquer, or varnish from metallic or non-metallic surfaces. Sprayed on the surface, it is reported to exert a solvent and swelling action, permitting final removal by mechanical means. It is described as non-toxic and non-flammable. **(No. 624)**

U S I

A new corrosion inhibitor is described as a colloidal gel which can be applied by dip or spray to form a corrosion-resisting film in process operations. Maker says that it can also be used as an addition agent in paint. **(No. 625)**

U S I

A chemically resistant paint is said to be capable of withstanding attack by caustic liquors up to 70% concentration, and to be almost completely inert to vinegar and to glacial acetic acid. **(No. 626)**

U S I

A traffic zoning paint has been formulated especially for marking factory floors, according to the manufacturer. It is said to dry for traffic within 15 minutes, to show high resistance to all types of traffic, and to maintain excellent visibility over long periods of time. **(No. 627)**

U S I

Two new bactericides have been added to the group of such substances isolated from fungi. Both of the new bactericides are said to have displayed high activity against gram-negative bacteria. **(No. 628)**

U S I

A photoelectric reflection meter recently placed on the market is said to be adaptable to measuring the reflectance and color of solid surfaces, fabrics, pastes, powders, and opaque liquids. It is provided with a search unit placed on the surface to be measured, so that test specimen need not be inserted into instrument. **(No. 629)**

ample for all foreseeable needs, there is a real transportation problem. The shipping shortage and the danger of submarine sinkings compel movement of the materials by rail for the most part instead of by coastwise ships, hitherto the main carriers. The lack of available ocean shipping facilities and the demand generated by munitions manufacturing have seriously affected the available supply of nitrogen carriers. In fact, the nitrogen supplies, instead of moving freely into the market as formerly, are now under direct allocation by the War Production Board. As an accompanying control, ceiling prices have been established by the Office of Price Administration upon retail sales of certain fertilizer materials.

Be sure to get your copy of the War Production Board's M-231 order on Chemical Fertilizers. Some important portions of it include: Fertilizer containing chemical nitrogen cannot be used on grains sown in the fall of 1942 to be harvested as grain. Delivery of any chemical fertilizer in bags of less than 100 pounds is stopped. Delivery of any superphosphates which carries less than 18 per cent available phosphoric acid is prohibited.

Insecticides: A shortage of insecticides essential in combating pests which prey on the cotton crop was reported last month to the American Chemical Society by Dr. R. C. Roark of the Bureau of Entomology and Plant Quarantine, U. S. Department of Agriculture.

"Sulfur appears to be the only material of which there is likely to be an abundant supply available," Dr. Roark said. "Supplies of copper, an ingredient of Paris green; lead, a constituent of lead arsenate; and mercury, used to make seed disinfectants are already short.

"It may become necessary to ration arsenic, which is going in increasing quantity into the manufacture of glass now needed in greater amount to replace tin for containers. All rotenone is imported, and the 1943 supply promises to be one-half of normal.

"More nicotine can be had only by using leaf tobacco, a procedure which is likely to boost the price beyond the reach of most farmers. It is imperative that insecticides be applied to cotton as effectively as possible to conserve the supply."

The estimated annual consumption of the principal insecticides and fungicides used to combat pests attacking cotton follows:

Arsenicals—including calcium arsenate, lead arsenate, Paris green and white arsenic—42,000,000 pounds; fluorine compounds—cryolite—400,000; contact poisons—nicotine sulfate solution, rotenone dusts, and sulfur—20,272,000; fungicides—organic-mercury seed disinfectant—600,000.

It is estimated that 20,000,000 pounds of sulfur are used annually as dusts upon cotton, mostly in Texas. About 32,000 pounds of nicotine sulfate solution, equivalent to 427,000 pounds of tobacco of 3 per cent nicotine content, are used annually on cotton. This is sufficient to make 512,000 pounds of nicotine dust.

The consumption of calcium arsenate, which is used chiefly against the boll weevil, fluctuates widely from year to year because of the fluctuations in the abundance of this insect, Dr. Roark explained. In 1941, when damage by boll weevils was unusually severe, most of the 70,000,000 pounds of calcium arsenate sold was used on cotton.

No fungicide is applied to growing cotton, but in many places the seed is treated to prevent seedling diseases and stimulate growth of the small plants. It is estimated that there are used annually for this purpose 600,000 pounds of organic-mercury seed disinfectants.

"The enormous production of cotton," Dr. Roark added, "would not be possible without the use of large quantities of many insecticides and fungicides designed to combat specific insect and fungus pests. The cotton plant is unusually attractive to insects, among which are some of the most destructive pests of agriculture".

Dr. Roark listed 27 principal insects which attack cotton. The most destructive is the boll weevil, which, it is conservatively estimated, destroys one-tenth of the cotton crop each year. A heavy toll is also exacted by other pests.

M. L. Crossley

(*Continued from page 557*)

City of New York, as well as a member of The Chemists' Club (New York).

Drawing upon his experience both in the classroom and in industry, Crossley has exerted his influence on every hand to raise the educational standards for chemists. He defines a chemist as any person "qualified by education and experience to ascertain the facts of chemistry and interpret them so as to benefit humanity and accelerate progress." In his opinion a minimum of six years' formal study is necessary before a person should be dubbed a "chemist," but no barrier should be raised to prevent anyone from obtaining the equivalent knowledge, if possible, by other means. He has maintained consistently that the fundamental courses in languages, mathematics, economics, humanities and like sciences are essential to the fully and properly trained chemist. While chairman of the committee on professional education of the A.I.C., he presented his principles to 568 universities and colleges of the land, and it is no secret that his efforts have gone far toward establishing a standard curriculum.

Although chemistry is Crossley's dominant interest, his life is varied by many hobbies, chief of which is sailing. Practically all his life he has been at home on the water and for many years he has been a past master of sailing. He has owned a number of boats and when possible his week-ends are spent at his summer home at Oak Bluffs, Martha's Vineyard, Mass., where, with his son, Evan, and his daughter-in-law, Mary Ella, as crew, he revels in his speedy thirty-four-foot Barnacle sloop, Elise. The past two years he has lived on the Elise at Riverside Yacht Club, to be near his duties at the Stamford Research Laboratories of the American Cyanamid Company. The doctor and Mrs. Crossley are both quite fond of dancing, also. He is a lover of nature and a member of Plainfield Nature Club, and being an expert photographer, he delights in taking pictures. He has taken many feet of moving pictures in this country and in Europe.

WASHINGTON

(*Continued from page 460*)

At about the same time these actions were announced, OPA established certain pricing procedure designed to insure an adequate supply of agricultural liming materials. However this provision—Amendment No. 9 to General Maximum Price Regulations' revised Supplementary Regulation No. 4—pertains only to sales and deliveries to the Agricultural Adjustment Agency, which distributes the bulk of such liming materials.

Recent action of WPB granting higher preference ratings in obtaining maintenance, repair and operating supplies, through Amendment No. 3 to P-89, is attributed to the increasing recognition of the importance of the chemical industry's war effort.

Personnel of the operating staff for the Referee Board of Chemicals Branch has also been announced by the chairman, Dr. Donald B. Keyes. Names include: Dr. Lawrence A. Monroe, Philadelphia, executive secretary to the Board; Dr. W. M. Langdon, Elizabeth, N. J., assistant to Dr. Monroe, both giving full time to the Board's activities; and cooperating on a part-time basis will be Dr. Carl Monrad, Dr. A. L. Elder, Dr. C. W. Lenth, E. M. Houts, and Walter Munster, all of whom are now officials of Chemicals Branch who will assume these additional duties.

Staff members will collect data on various problems which will be referred to the Board. The Referee Board is composed of 12 eminent chemists and chemical engineers, who report on the merits of competing chemical processes submitted to WPB, and also act in an advisory capacity in assignment of raw research problems to various laboratories all over the nation.

PRICES CURRENT

Chemical prices quoted are of American manufacturers for spot New York, immediate shipment, unless otherwise specified. Products sold f.o.b. works are specified as such. Import chemicals are so designated.

Oils are quoted spot New York, ex-dock. Quotations f.o.b. mills, or for spot goods at the Pacific Coast are so designated.

Raw materials are quoted New York, f.o.b., or ex-dock. Materials sold f.o.b. works or delivered are so designated.

The current range is not "bid and asked," but are prices from different sellers, based on varying grades or quantities or both.

Purchasing Power of the Dollar: 1926 Average—$1.00 - 1940 Average $1.20 - Jan. 1941 $1.16 Sept. 1942 $0.93

	Current Market	1942 Low	1942 High	1941 Low	1941 High
Acetaldehyde, 99%, 55, 110 gal drs, wks lb.	...	.11	.11	.11	.11
Acetaldol (Aldol), 55, 110 gal drs, c-l, wks lb.	..	.12	.12	.11	.13
Acetamide, tech, kgs, wks lb.	.28	.50	.28	.50	.28	.45
Acetanilid, tech, cryst, bbls lb.	.29	.31	.29	.31	.29	.31
powd, bbls lb.	.27	.29	.27	.29	.27	.29
Acetic Anhydride, drs, c-l, frt all'd lb.	.11½	.13	.11½	.13	.10½	.13
Acetin, tech, lcl drs lb.	...	.29	.29	.29	.29	.33
Acetone, tks, delv (*PC*) lb.	...	.07	.07	.158	.06	.158
drs, c-l, delv (*PC*) lb.	...	.08½	.08½	.173	.07½	.173
Acetonitrile, drs, wks lb.	1.00	2.00	1.00	2.00	1.00	2.00
Acetophenone, drs lb.	1.55	1.60	1.55	1.60	1.55	1.60
Acetophenetidin, bbls, kgs, 1000 lbs lb.	...	1.00	1.00	1.00	1.00	1.00
ACIDS						
Acetic, 28%, bbls (*PC*) 100 lbs.	3.38	3.63	3.38	3.63	2.23	3.43
glacial, nat, bbls 100 lbs.	9.15	9.40	9.15	9.40	7.62	8.55
synth, drs 100 lbs.	9.15	9.40	9.15	9.40	7.62	8.55
tks, wks 100 lbs.	6.25	6.93	6.25	6.93	...	...
Acetylsalicylic, USP, (*PC*) special, 200 lb bbls lb.	...	.45	.45	.45	.45	.45
Standard USP lb.	...	.40	.40	.40	.40	.40
Adipic, fib drs, wks lb.	...	.31	.31	.31	.31	.31
Anthranilic, ref'd bbls lb.	1.20	1.25	1.20	1.25	1.15	1.20
tech, bbls lb.	...	.95	.95	.95	.75	.95
Ascorbic, bots, drs (*PC*) oz.	1.50	1.70	1.50	1.85	1.85	2.10
Battery, cbys, wks 100 lbs.	1.60	2.55	1.60	2.55	1.60	2.55
Benzoic, tech, bbls lb.	.43	.47	.43	.47	.43	.47
USP, bbls lb.	.54	.59	.54	.59	.54	.59
Boric, tech, gran, frt all'd bgs 40 tons ton *a*	...	99.00	99.00	99.00	93.50	99.50
bbls ton *a*	...	109.00	108.00	109.00	108.00	108.00
Broenner's, bbls lb.	...	1.11	1.11	1.11	1.11	1.11
Butyric, c-l drs, wks lb.	...	.22	.22	.22	.22	.22
tks, wks lb.	...	.21	.21	.21	.21	.21
Caproic, drs, wks lb.	...	.35	.25	.35	.25	.30
Chlorosulfonic, drs, wks lb.	.03	.04½	.03	.04½	.03½	.05
tks, wks lb.	...	.02½	.02½	.02½	...	...
Chromic, drs (*FP*) lb.	.16¼	.18¼	.16¼	.18¼	.15¼	.17¼
Citric, crys, gran, bbls lb. *b*	.20	.21	.20	.21	.20	.21
Anhyd gran, drs (*PC*) lb.	.22½	.26½	.22½	.26½	.23	.26½
Cleve's bbls lb.	...	.65	.65	.65	.65	.65
Cresylic 50%, 210-215° HB, drs, wks, frt equal (A) gal.	.81	.83	.81	.86	.76	.84
Low Boiling gal.	.81	.83	.81	.86	.76	.84
Formic, tech, cbys lb.	.10½	.11½	.10½	.11½	.10½	.11½
Fumaric, bbls lb.	.27	.31	.27	.31	.24	.29
Gallic, tech, bbls lb.	1.10	1.12	1.10	1.13	.90	1.13
NF bbls lb.	1.27	1.30	1.27	1.30	1.10	1.30
H, bbls wks lb.	...	.45	.45	.45	.45	.45
Hydrochloric, see muriatic						
Hydrocyanic cyls, wks lb.	.80	1.00	.80	1.00	.80	1.00
Hydrofluoric, 30%, bbls, wks lb.	.06	.06½	.06	.06½	.06	.06½
Hydrofluosilic, 35%, bbls lb.	.09	.09½	.09	.09½	.09	.09½
Lactic, 22% dark, bbls lb.	.029	.0315	.029	.035	.02½	.035
22%, light, bbls wks lb.	.039	.0415	.039	.0415	.03½	.0415
44%, dark, bbls wks lb.	.063	.0655	.063	.0655	.05½	.0655
44%, light, bbls wks lb.	.073	.0755	.073	.0755	.06½	.073
Lauric, dist, tech, drs lb.	.20	nom.	.20	.20½	.15	.18¾
Laurent's bbls lb.	...	.45	.45	.45	.45	.45
Maleic, powd, drs lb.	...	.30	.30	.30	.30	.30
Anhydride, drs lb.	.25	.26	.25	.26	.25	.26
Malic, powd, kgs lb.	...	.47	.47	.47	.47	.47
Mixed, tks N unit lb.	.05	.06	.05	.06	.05	.06
S unit lb.	.0085	.009	.0085	.009	.0085	.009
Molybdic, kgs, wks lb.	.95	1.10	.95	1.10	.95	1.10
Monochloracetic, tech, bbls lb.	...	.17	.17	.17	.15	.18
Monosulfonic, bbls lb.	...	1.50	1.50	1.50	1.50	1.50
Muriatic, 18° cbys, c-l wks 100 lb.	...	1.50	1.50	1.50	1.50	1.50
tks, wks 100 lb.	...	1.05	1.05	1.05	1.05	1.05
20°cbys, c-l, wks 100 lb.	...	1.75	1.75	1.75	1.75	1.75
tks, wks 100 lb.	...	1.15	1.15	1.15	1.15	1.15
22° cbys, c-l, wks 100 lb.	...	2.25	2.25	2.25	2.25	2.25
tks, wks 100 lb.	...	1.65	1.65	1.65	1.65	1.65
CP cbys lb.	.06½	.08	.06½	.08	.06½	.08
Acid (continued):						
Myristic, dist, drs lb.	.19	.19½	.18	.19½	.18	.18½
Naphthenic drs, 220-230 lb.		.13	.10	.13	.10	.10
tks, wks (A) lb.	...	.10	.09	.10	.09	.09
Naphthionic, tech, bbls lb	.60	.65	.60	.65	.60	.65
Nicotinic fib-dms lb.	5.00	5.50	5.00	7.15	7.15	7.15
Nitric, 36°, cbys, c-l, wks 100 lbs. *c*	...	5.00	5.00	5.00	5.00	5.00
38°, c-l, cbys, wks 100 lbs. *c*	...	5.50	5.50	5.50	5.50	5.50
40°, c-l, cbys, wks 100 lbs. *c*	...	6.00	6.00	6.00	6.00	6.00
42°, c-l, cbys, wks 100 lbs. *c*	...	6.50	6.50	6.50	6.50	6.50
CP, cbys lb.	.11½	.13	.11½	.13	.11½	.13
Oxalic, bbls, wks (*PC*) lb.	.11¼	.12½	.11¼	.14½	.11½	.14¼
Phosphoric, 85% USP, cbys lb.	...	.12	.12	.12	.12	.12
50% food grade, c-l, bbls, wks, frt equal 100 lbs.	4.00	4.25	4.00	4.25	4.00	4.25
Picramic, kgs lb.	.65	.70	.65	.70	.65	.70
Picric, bbls, wks lb.	...	.35	.35	.35	.35	.35
Propionic, pure, drs, wks lb.	...	.14	.14	.14	.14	.14
tks, wks lb.	...	.11	.11	.11	.11	.11
Pyrogallic, tech, lump, pwd, bbls lb.	...	1.45	1.45	1.45	1.45	1.45
USP, cryst, cns lb.	...	2.10	2.10	2.10	1.70	2.25
Pyroligneous, bbls, delv gal.	...	.25	.25	.25	.25	.25
Ricinoleic, tech, drs, wks lb.	.32	.37	.32	.37	.32	.37
Salicylic, tech, 125 lb bbls, wks (*PC*) lb.	...	.33	...	.33	...	.33
USP, bbls lb.	.35	.46	.35	.46	.35	.40
Sebasic, tech, bbls, wks lb.	.65	.69	.65	.82	.82	.82
Stearic, see under Oils & Fats						
Succinic, bbls lb.	...	.75	...	.75	...	.75
Sulfanilic, 250 lb drs, wks lb.	...	.17	...	.17	...	.17
Sulfuric, 60°, tks, wks ton	...	13.00	...	13.00	...	13.00
c-l, cbys, wks 100 lb.	...	1.25	...	1.25	...	1.25
66°, tks, wks ton	...	16.50	...	16.50	...	16.50
c-l, cbys, wks 100 lb.	...	1.50	...	1.50	...	1.50
CP, cbys, wks lb.	.06½	.08	.06½	.08	.06½	.08
Fuming (Oleum) 20% tks, wks ton	...	19.50	...	19.50	18.50	19.50
Tannic, tech, 300 lb bbls (*A*) lb.	.71	.73	.71	.73	.54	.73
Tartaric, USP, gran, powd, 300 lb bbls lb.	...	.70½	...	.70½	.46¼	.70½
Tobias, 250 lb bbls lb.	.55	.60	.55	.60	.55	.60
Trichloroacetic bottles lb.	2.00	2.50	2.00	2.50	2.00	2.50
Tungstic, pure 100 lb. pkg. (A) lb.	...	2.86	...	2.86	no prices	
Acrylonitrile, tks (A) lb.	...	.34	.34	.34	...	...
Albumen, light flake, 225 lb bbls lb.	.65	.70	.65	.75	.55	.75
dark, bbls lb.		.13½	.12½	.14	.13	.18
egg, edible lb.	1.73	1.78	1.73	1.85	.65	1.85
Alcohol, Amyl (from Pentane) tks, delv lb.	...	.131	...	.131	.111	.131
c-l, drs, delv lb.	...	.141	...	.141	.121	.141
lcl, drs, delv lb.	...	.151	...	.151	.131	.151
Amyl, normal lcl drs Wyandotte, Mich. lb.	...	.27	.27	.42	.25	.27
secondary, tks, delv lb.						
drs, c-l, delv E of Rockies lb.	...	.09½	...	.09½	...	.09½
tertiary, rfd, lcl, drs, f.o.b., Wyandotte, frt all'd lb.	...	.09	...	.09	...	.09
Benzyl, cans lb.	.65	.75	.65	.75	.65	.75
Butyl, normal, tks, f.o.b. wks, frt all'd (*PC*) (A) lb.	...	.14¼	.12½	.168	.09	.158
c-l, drs, f.o.b. wks, frt all'd lb.	...	.15¼	.13½	.173	.10	.168
Butyl, secondary, tks, delv (*A*) lb.	...	.08½	...	.08½	.07¼	.08½
c-l, drs, delv lb.	...	.09½	...	.09½	.08¼	.09½
Butyl, tert denat c-l drs lb.	...	.12½	...	.12½	...	.12½
lcl drs lb.	...	.13	...	.13	...	.13
tks lb.	...	.11½	...	.11½	...	.11½
Capryl, drs, crude, wks lb.	...	.16	...	.16	...	.16
Cinnamic, bottles lb.	3.00	3.60	3.00	3.60	2.33	3.60
Denatured, CD, 14, c-l drs, wks (*PC, FP*) gal.	...	.65	...	.65	.36½	.45½
tks, East, wks gal.	...	.58	...	.58	.26½	.58
Denatured, SD, No. 1, tks,	...	.53	...	.53	.28½	.53

a Powdered boric acid $5 a ton higher; USP $25 higher; *b* Powdered citric is ½c higher; kegs are in each case ½c higher than bbls; Prices are f.o.b. N. Y., Chicago, St. Louis, deliveries ½c higher than NYC prices; *y* Price given is per gal.

(*A*) Allocations. (*FP*) Under full priority control. (*PC*) Under price ceiling.

c Yellow grades 25c per 100 lbs. less in each case. *d* Prices given are Eastern schedule; Territories other east of Rockies and 15½c per gal. less than Eastern Works price.

ABBREVIATIONS—Anhydrous, anhyd; bags, bgs; barrels, bbls; carboys, cbys; carlots, c-l; less-than-carlots, lcl; drums, drs; kegs, kgs; powdered, powd; refined, ref'd; tanks, tks; works, f.o.b., wks.

		Current Market	1942 Low	1942 High	1941 Low	1941 High
Alcohols (continued):						
Diacetone, pure, c-l drs, delv	lb. *f*	.11½	.11½	.14½	.09½	.13
tks, delv	lb.	.10½	.11½	.13½	.10½	.13½
tech, contract, drs, c-l, delv	lb.	.11	.11½	.11	.13½	.09 .12
tks, delv	lb.	.10	.12½	.10	.14	.10 .12½
Ethyl, 190 proof molasses, tks	gal. *g*	...	8.12	...	8.12	5.96½ 8.12
c-l, drs	gal. *g*	...	8.19	...	8.19	6.02½ 8.19
c-l, bbls	gal. *g*	...	8.25½	...	8.25½	6.03½ 8.25
Furfuryl, tech, 500 lb. drs	lb.	.20	.35	.20	.35	.20 .25
Hexyl, secondary tks, delv	lb.	...	.23	...	.23	.12 .23
c-l, drs, delv	lb.	...	.24	...	.24	... .13
Isoamyl, prim, cans, wks	lb.	...	.32	...	.32	... .32
drs, lcl, delv	lb.	...	.22½	...	.22½	.22½ .27
Isobutyl, ref'd, lcl, drs	lb.	...	.086	...	.086	.079 .086
c-l, drs	lb.	...	.076	...	.076	.069 .076
tks	lb.	...	.076	...	.076	.069 .076
Ethylhexyl, tks, wks	lb.	.23	.25	.23	.25	.23 .23
Isopropyl, ref'd, 91% drs, frt all'd	gal.	.40½	.43½	.40½	.43½	.40½ .43½
tks, frt all'd	gal.	...	.34	.34	.34	.34 .34
99%, drs, frt all'd	gal.	.44	.47	.44	.47	.44 .47
tks, frt all'd	gal.	...	.37½	.37½	.37½	.37½ .37½
Octyl, see Ethylhexyl						
Polyvinyl A fib drs	lb.	...	.65	.54	.65	.26 .54
B fib drs	lb.	.60	.65	.60	.70	... ...
Propyl, nor, drs, wks	gal.	.67	.70	.69	.75	... ...
Spec Solvents, East, drs, wks	gal.	...	.61	.61	.70	... ...
tks, East, wks	gal.	...	.54	.54	.66	... ...
Tetrahydrofurfuryl drs, f.o.b. wks	lb.	.44	.50	.44	.50	... ...
Aldehyde ammonia, 100 gal drs	lb.	.65	.70	.65	.70	.65 .70
Aldehyde Bisulfite, bbls, delv	lb.	...	.17	...	.17	... .17
Aldol, 95%, 55 and 110 gal, drs, delv	lb.	.12	.15	.12	.15	.11 .15
Alphanaphthol, crude, 300 lb bbls	lb.	...	.52	...	.52	... .52
Alphanaphthylamine, 350 lb bbls	lb.	...	.32	...	.32	... .32
Alum, ammonia, lump, c-l, bbls, wks	100 lb.	...	4.25	...	4.25	3.75 4.25
delv NY, Phila	100 lb.	...	4.25	...	4.25	3.75 4.25
Granular, c-l, bbls wks	100 lb.	...	4.00	...	4.00	3.50 4.00
Powd, c-l, bbls, wks	100 lb.	...	4.40	...	4.40	3.90 4.40
Potash, lump, c-l, bbls, wks	100 lb.	...	4.50	...	4.50	4.00 4.50
Granular, c-l, bbls, wks	100 lb.	...	4.25	...	4.25	3.75 4.25
Powd, c-l, bbls, wks	100 lb.	...	4.65	...	4.65	4.15 4.65
Soda, bbls, wks	100 lb.	...	3.25		3.25	3.25
Chrome, bbls	100 lb.	.12½	.15	.12½	.15	no prices
Aluminum metal, c-l, (*FP*)	100 lb.	15.00	16.00	15.00	16.00	17.00 18.00
Acetate, 20%, nor sol, bbls	lb.	.09½	.10½	.09½	.11	.10½ .11
Basic powd, bbls, delv	lb.	.40	.50	.40	.50	.35 .50
24% sol, bbls, delv	lb.	.10½	.11	.10½	.11	.09½ .12
Chloride anhyd 99% wks	lb.	.08	.12	.08	.12	.08 .12
Crystals, c-l, drs, wks	lb.	.06	.06½	.06	.06½	.06 .06½
Solution, drs, wks	lb.	.02¾	.03¼	.02¾	.03¼	.02¾ .03¼
Formate, 30% sol bbls, c-l, delv	lb.	.13	.15	.13	.15	.13 .15
Hydrate, 96%, light, 90 lb. bbls, delv (A)	lb.	...	.14½	...	.14½	.12½ .14½
heavy, bbls, wks	lb.	...	.034	...	.034	.029 .03½
Oleate, drs	lb.	...	.24½	.17½	.26	.17½ .20
Palmitate, bbls	lb.	.25	.26	.25	.26	.20½ .26
Resinate, pp., bbls	lb.	...	.15½	.15	.15½	... .15
Stearate, 100 lb bbls	lb.	.23	.24	.22	.24	.18 .23
Sulfate, com, c-l, bgs, wks	100 lb.	1.15	1.25	1.15	1.25	1.15 1.25
c-l, bbls, wks	100 lb.	1.35	1.45	1.35	1.45	1.35 1.45
Sulfate, iron-free, c-l, bgs, wks	100 lb.	1.75	1.85	1.75	1.85	1.60 1.85
c-l, bbls, wks	100 lb.	1.95	2.05	1.95	2.05	1.80 2.10
Ammonia anhyd fert com, tks	lb.	.04½	.05	.04½	.05	.04½ .05
Ammonia anhyd, 100 lb cyl	lb.	...	.16	...	.16	... .16
26°, 800 lb drs, delv	lb.	.02¾	.02½	.02¼	.02½	.02¼ .02½
Aqua 26°, tks, NH_3 cont.		...	.04	.04	.08z	.04 .05¼
Ammonium Acetate, kgs	lb.	.27	.33	.27	.33	.27 .33
Bicarbonate, bbls, f.o.b. wks	100 lb	.0564	.0614	.0564	.0614	.0564 .0614
Bifluoride, 300 lb bbls	lb.	.16	.18	.15½	.18	.14 .18
Carbonate, tech, 500 lb bbls	lb.	.08¾	.09¼	.08¾	.09¼	.08¾ .09¼
Chloride, White, 100 lb. bbls, wks	100 lb.	...	4.45	4.45	...	4.45 ...
Gray, 250 lb bbls, wks	100 lb.	5.50	5.75	5.50	5.75	5.50 5.75
Lactate, 500 lb bbls	lb.	.15	.16	.15	.16	.15 .16
Laurate, bbls	lb.	...	.23	...	.23	... .23
Linoleate, 80% anhyd, bbls	lb.	...	.12	...	.12	... .12
Nitrate, tech, bgs, bbls	lb.	.0435	.0455	.0435	.0455	.0435 .0455
Oleate, drs	lb.	...	.14	...	.14	... .14
Oxalate, neut, cryst, powd, bbls	lb.	.23	.29	.23	.29	.19 .29
Perchlorate, kgs (A)	lb.	.55	.65	.55	.65	.55 .65
Persulfate, 112 lb kgs	lb.	.25½	.28½	.21	.28½	.21 .22

z On a f.o.b. wks. basis.
(A) Allocation

		Current Market	1942 Low	1942 High	1941 Low	1941 High
Ammonium (continued):						
Phosphate, diabasic tech, powd, 325 lb bbls	lb.	...	.07¼	.09¼	.09¼	.07¼ .09¼
Ricinoleate, bbls	lb.	...	.15	...	.15	... .15
Stearate, anhyd, bbls	lb.	...	.24½	...	.24½	... .24½
Paste, bbls	lb.	...	.06½	...	.06½	... .06½
Sulfate, dom. f.o.b., bulk (A)	ton	29.00	30.00	29.00	30.00	29.00 30.00
Sulfocyanide, pure, kgs	lb.	.45	.55	.45	.55	.45 .65
Amyl Acetate (from pentane)						
tks, delv	lb.	...	.145	...	.145	.105 .145
c-l, drs, delv	lb.	...	.155	...	.155	.115 .155
lcl, drs, delv	lb.	...	165	...	.165	.125 .165
tech drs, ex-fusel oil delv	lb.	.14½	.17	.14½	.17	... .14½
Secondary, tks, delv	lb.	...	.08½	...	.08½	... .08½
c-l, drs, delv	lb.	...	.09½	...	.09½	... .09½
tks, delv	lb.	...	.08½	...	.08½	... .08½
Chloride, norm, drs, wks	lb.	no prices		.56	.68	.56 .68
mixed l c l drs, wks	lb.	...	.08	...	.08	.0565 .08
tks, wks	lb.	...	.06	...	.06	.0465 .06
Amyl Ether (see Diamyl						
lcl, dms	lb.	...	.102	...	.102	... ...
cl, dms	lb.	...	.095	...	.095	... ...
tks	lb.	...	.085	...	.085	... ...
Mercaptan, drs, wks	lb.	...	1.10	...	1.10	... 1.10
Oleate, lcl, wks, drs	lb.	...	.31	...	.31	.25 .31
Stearate, lcl, wks, drs	lb.	...	.32½	...	.32½	.26 .335
Amylene, c-l, drs, f.o.b. wks,	lb.	...	.102	.102	.11	.102 .11
lcl, dms, f.o.b., wks		...	.11	...	.11	... ...
tks, f.o.b., wks	lb.	...	.09	...	.09	... .09
Amylnaphthalenes, see Mixed Amylnaphthalenes						
Aniline Oil, 960 lb drs and tks	lb.	.12½	.16	.12½	.16	... .14½
Annatto fine	lb.	.34	.39	.34	.39	.34 .39
Anthracene, 80-85%	lb.	...	.55	...	.55	... .55
Anthraquinone, sublimed, 125 lb bbls	lb.	...	.70	...	.70	.65 .70
Antimony metal slabs, ton lots	lb.	...	.14½	.14	.14½	.14 .16½
Butter of, see Chloride						
Chloride, soln, cbys	lb.	...	17	...	.17	... .17
Needle, powd, bbls	lb.	.18½	.20	.18½	.20	.16 .18
Oxide, 500 lb bbls (A)	lb.	.15	.15½	.15	.16½	.12 .16½
Salt, 63% to 65%, drs	lb.	...	.40	.34	.40	.28 .34
Archil, conc, 600 lb bbls	lb.	...	.26	...	.26	no prices
Aroclors, wks	lb.	.18	.30	.18	.30	.18 .30
Arrowroot, bbls	lb.	.09½	.09¾	.09½	.10¾	.09½ .10¾
Arsenic, Metal	lb.	no prices		no prices		no prices
Red, 224 lb ca kgs	lb.	no prices		no prices		no prices
White, 112 lb kgs. (A)	lb.	.04	.04¼	.04	.04¼	.03½ .04¼
B						
Barium Carbonate precip, 200 lb bgs, wks	ton	55.00	65.00	55.00	65.00	45.00 65.00
Nat (witherite) 90% gr, c-l, wks, bgs	ton	...	43.00	...	43.00	... 43.00
Chlorate, 112 lb kgs, NY (A)	lb.	...	.60	...	.60	... .45
Chloride, 600 lb bbls, delv, zone 1	ton	77.00	92.00	77.00	92.00	77.00 92.00
Dioxide, 88%, 690 lb drs	lb.	...	.10	...	.10	... .10
Hydrate, 500 lb bbls	lb.	.06	.07	.06	.07	.05½ .07
Nitrate, bbls	lb.	.11	.12	.10½	.12½	.08½ .12½
Barytes, floated, 350 lb bbls c-l, wks	ton	...	27.65	...	27.65	25.15 27.65
Bauxite, bulk mines (A)	ton	7.00	10.00	7.00	10.00	7.00 10.00
Bentonite, c-l, 325 mesh, bgs, wks	ton	...	16.00	...	16.00	... 16.00
200 mesh	ton	...	11.00	...	11.00	... 11.00
Benzaldehyde, tech, 945 lb. drs, wks	lb.	.45	.55	.45	.55	.45 .55
Benzene (Benzol), 90%, Ind. 8000 gal tks, ft all'd	gal.	(A)	.15	...	.15	.14 .15
90% c-l, drs	gal.	...	.20	...	.20	.19 .20
Ind pure, tks, frt all'd	gal.	...	.15	...	.15	.14 .15
Benzidine Base, dry, 250 lb. bbls	lb.	...	.70	...	.70	... .70
Benzoyl Chloride, 500 lb drs	lb.	.23	.28	.23	.28	.23 .28
Benzyl Chloride, 95-97% rfd, drs	lb.	.22	.24	.22	.24	.19 .24
Beta-Naphthol, 250 lb bbls, wks	lb.	.23	.24	.23	.24	.23 .24
Naphthylamine, sublimed, 200 lb bbls	lb.	...	1.25	1.25	...	1.25 1.35
Tech, 200 lb bbls	lb.	...	.51	...	.51	.51 .52
Bismuth metal	lb.	...	1.25	...	1.25	... 1.25
Chloride, boxes	lb.	...	3.00	...	3.00	3.00 3.25
Hydroxide, boxes	lb.	3.35	3.46	3.35	3.46	3.35 3.46
Oxychloride, boxes	lb.	3.10	3.19	3.10	3.19	3.10 3.19
Subbenzoate, fib dms	lb.		3.40	...	3.40	... 3.40
Subcarbonate, kgs	lb.	1.59	1.85	1.59	1.85	1.59 1.85
Subnitrate, fibre, drs	lb.	1.29	1.33	1.29	1.57	1.20 1.57
Trioxide, powd, boxes	lb.		3.65		3.65	... 3.65
Blanc Fixe, Pulp, 400 lb. bbls, wks	ton *h*	40.00	46.50	40.00	46.50	35.00 46.50
Bleaching Powder, 800 lb drs, c-l, wks, contract 100 lb.		2.25	3.10	2.25	3.10	2.00 3.10
lcl, drs, wks	lb.	2.50	3.35	2.50	3.35	2.25 3.35
Blood, dried, f.o.b., NY unit			5.50	5.25	5.75	4.75 5.25
Chicago, high grade	unit	5.85	5.90	5.40	5.90	5.00 5.40
Imported shipt	unit	5.45	nom.	5.00	5.50	4.75 5.00
Blues, Bronze Chinese						
Prussian Soluble	lb.	...	.36	...	.36	.33 .36
Milori, bbls	lb.	...	.36	...	.36	.33 .36

h Lowest price is for pulp, highest for high grade precipitated; *i* Crystals $6 per ton higher; USP, $15 higher in each case; * Freight is equalized in each case with nearest producing point.

		Current Market	1942 Low	1942 High	1941 Low	1941 High
Blues (continued):						
Ultramarine,* dry, wks, bbls	lb.	.12	.13	.11	.13	.11
Regular grade, group 1	lb.	.17	.27	.16	.27	.16	.20
Pulp, Cobalt grade	lb.	.23	.27	.22	.27	.22	.24
Bone, 4½ + 50% raw, Chicago	ton	...	39.50	39.00	40.00	30.00	40.00
Bone Ash, 100 lb kgs	lb.	.06	.07	.06	.07	.06	.07
Meal, 3% & 50% imp	ton	...	37.50	...	37.50	31.50	37.50
Domestic, bgs, Chicago	ton	38.00	40.00	38.00	40.00	32.00	40.00
Borax, tech, gran, 80 and 40 ton lots, bgs, delv	ton *j*	...	46.00	45.00	46.00	43.00	45.00
bbls, delv (*FP*)	ton *j*	...	55.00	54.00	55.00	53.00	56.00
Tech, powd, 80 and 40 ton lots, bgs	ton	...	51.00	50.00	51.00	48.00	50.00
bbls, delv	ton	...	60.00	59.00	60.00	58.00	61.00
Bordeaux Mixture, drs	lb.	.11	.11½	.11	.11½	.11	.11½
Bromine, cases	lb.	.25	.30	.25	.30	.25	.30
Bronze, Al, pwd, 300 lb drs (*FP*)	lb.	...	.59	...	.59	...	.57
Gold, blk	lb.	.60	.65	.60	.65	.60	.65
Butanes, com 16-32° group 3 tks (*PC*)	lb.	.02½	.03½	.02½	.03½	.02½	.03
Butyl, acetate, norm drs, frt all'd	lb.	...	.15¾	.14½	.168	.10	.168
tks, frt all'd	lb.	...	.14¾	.13½	.158	.09	.158
Secondary, tks, frt all'd	lb.	...	.08½	...	.08½	.07¼	.08½
drs, frt all'd	lb.	...	.09½	...	.09½	.08¾	.09½
Aldehyde, 50 gal drs, wks	lb.	.14½	.16½	.14½	.17½	.15½	.17½
Carbinol, norm (see Normal Amyl Alcohol)							
Chloride, normal lcl, drs	lb.	...	.35	.28	.35	...	...
c-l, drs	lb.	...	.32	.25	.32	...	...
Crotonate, norm, 55 and 110 gal drs, delv	lb.	...	.35	...	.35	...	.35
Lactate	lb.	...	.26½	...	.26½	...	.23½
Oleate, drs, frt all'd	lb.	...	.25	...	.25	...	.25
Propionate, drs	lb.	.16½	.17	.16½	.17	.16½	.17
tks, delv	lb.	...	.35	.25	.35	...	.25
Stearate, 50 gal drs	lb.	...	.31	...	.31	.28½	.32½
Tartrate, drs	lb.	no prices		no prices		.55	.60
Butyraldehyde, drs, lcl, wks	lb.	...	.35½	...	.35½	...	.35½
C							
Cadmium Metal (*PC*)	lb.	.90	.95	.90	.95	.80	.95
Sulfide, orange, boxes	lb.	...	1.10	...	1.10	...	1.10
Calcium, Acetate, 150 lb bgs c-l, delv	100 lb.	3.00	4.00	3.00	4.00	1.90	4.00
Arsenate, c-l, E of Rockies, dealers, drs	lb.	.07	.08	.06½	.08	.06	.07½
Carbide, drs	lb.	...	.04¾	...	.04¾	...	.04¾
Carbonate, tech, 100 lb bgs, c-l	ton	16.00	20.00	16.00	20.00	16.00	20.00
Chloride, flake, 375 lb drs, burlap bgs, c-l, delv	ton	...	21.00	...	21.00	...	20.50
paper bgs, c-l, delv	ton	18.50	41.00	18.50	41.00	18.50	35.00
Solid, 650 lb drs, c-l, delv	ton	18.00	34.50	18.00	34.50	18.00	34.50
Ferrocyanide, 350 lb bbls wks	lb.	...	.20	...	.20	...	.20
Gluconate, Pharm, 125 lb bbls	lb.	.52	.59	.52	.59	.52	.59
Levulinate, less than 25 bbl lots, wks	lb.	...	3.00	...	3.00	...	3.00
Nitrate, 100 lb bgs	ton	no prices		no prices		no prices	
Palmitate, bbls	lb.	.28	.29	.28	.29	.22	.29
Phosphate, tribasic, tech, 450 lb bbls	lb.	.0635	.0705	.0635	.0705	.0635	.0705
Resinate, precip, bbls	lb.	.15	.16	.13	.16	.13	.14
Stearate, 100 lb bbls	lb.	.26	.27	.26	.27	.20½	.27
Camphor, slabs	lb.	1.60	1.65	1.60	1.65	.73	1.65
Powder	lb.	1.60	1.65	1.60	1.65	.63	1.65
Carbon Bisulfide, 500 lb drs	lb.	.05	.05¾	.05	.05¾	.05	.05¾
Black, c-l, bgs, f.o.b. plants	lb.	...	.03625	...	.03625	.03325	.0342
Decolorizing, drs, c-l	lb.	.08	.15	.08	.15	.08	.15
Dioxide, Liq, 20-25 lb cyl	lb.	.06	.08	.06	.08	.06	.08
Tetrachloride, (*FP*) (*PC*) 55 or 110 gal drs, c-l, delv	gal.	...	.83	.73	.83	.66½	.73
Casein, Standard, Dom, grd	lb.	...	.14½	.15	.30½	.11½	.31
80-100 mesh,c-l bgs	lb.	...	.20	.15½	.31	.12	.31½
Castor Pomace, 5½ NH_3, c-l, bgs, wks (*PC*)	ton	...	19.00	16.00	19.00	15.00	16.00
Imported, ship, bgs	ton	no prices		no prices		no prices	
Celluloid, Scraps, ivory cs	lb.	.13	.15	.13	.15	.12	.15
Transparent, cs	lb.	...	.20	...	.20	...	.20
Cellulose, Acetate, frt all'd, 50 lb kgs	lb.	...	.30	...	.30	...	.30
Triacetate, flake, frt all'd	lb.	...	.30	...	.30	...	.30
Chalk, dropped, 175 lb bbls	lb.	...	.02¾	...	.02¾	.02¾	.02¾
Precip, heavy, 560 lb cks	100 lbs.	...	32.50	32.50	32.50	32.50	32.50
Charcoal, Hardwood, lump, blk, wks	bu.	...	.15	...	.15	...	.15
Softwood, bgs, delv*	ton	27.50	38.50	25.00	38.50	25.00	36.00
Willow, powd, 100 lb bbls, wks	lb.	.06	.07	.06	.07	.06	.07
Chestnut, clarified tks, wks	lb.	.	.0225	...	.0225	.01¾	.0275
25%, bbls, wks	lb.	...	.0275	...	.0275	.0240	.0275
China Clay, c-l, blk mines	ton	...	7.60	...	7.60	...	7.60
Imported, lump, blk	ton	19.00	24.00	18.60	24.00	18.60	...

j A delivered price; * Depends upon point of delivery
(*FP*) Full Priority. (*PC*) Price Ceiling.
(A) Allocation.

		Current Market	1942 Low	1942 High	1941 Low	1941 High
Chlorine, cyls, lcl, wks, contract (*FP*) (A)	lb.	...	.07¾	...	.07¾	...	.07¾
cyls, c-l, contract	lb. *j*	...	.05¼	...	.05¼	...	.05¼
Liq, tk, wks, contract	100 lb.	...	1.75	...	1.75	...	1.75
Multi, c-l, cyls, wks, cont	lb.	...	2.00	...	2.00	1.90	2.00
Chloroacetophenone, tins, wks	lb.	3.00	3.50	3.00	3.50	3.00	3.50
Chlorobenzene, Mono, 100 lb. drs, lcl, wks	lb.	...	.08	...	.08	.06	.08
Chloroform, tech, 650 lb drs	lb.	...	.20	...	.20	...	.20
USP, 650 lb drs	lb.	...	.30	...	.30	...	.30
Chloropicrin, comml cyls	lb.	...	.80	...	.80	...	.80
Chrome, Green, CP	lb.	.23	.33	.23	.33	.21	.25
Yellow	lb.	.16	.17	.16	.17	.13½	.14½
Chromium Acetate, 8% Chrome, bbls	lb.	.07¾	.08½	.07¾	.08½	.07¾	.08½
Fluoride, powd, 400 lb bbls	lb.	.27	.28	.27	.28	.27	.28
Coal tar, bbls	bbl.	8.25	9.25	7.50	9.25	7.50	7.75
Cobalt Acetate, bbls (A)	lb.	...	.83¾	...	.83¾	.80½	.83¾
Carbonate tech, bbls (A)	lb.	...	1.58	...	1.58	...	1.58
Hydrate, bbls (A)	lb.	...	2.04	...	2.04	1.98	2.04
Linoleate, solid, bbls	lb.	...	.44	.42	.44	.33	.42
paste, 5%, drs	lb.	.32	.35	.31	.35	...	.31
Oxide, black, bgs (A)	lb.	...	1.84	.	1.84	...	1.84
Resinate, fused, bbls	lb.	...	.15	.13½	.15	...	.13½
Precipitated, bbls	lb.	...	.38	.34	.38	...	.34
Cochineal, gray or bk bgs	lb.	.37	.38	.37	.38	.37	.38
Teneriffe silver, bgs	lb.	.38	.39	.38	.39	.38	.39
Copper, metal *FP*, *PC*	100 lb.	12.00	12.50	12.00	12.50	12.00	12.50
Acetate, normal, bbls, delv (A)	lb.	.24	.26	.24	.26	.22	.26
Carbonate, 52-54% 400 lb bbls (A)	lb.	.18	.20½	.18	.20½	.1650	.20½
Chloride, 250 lb bbls (A)	lb.	...	.23¼	.19½	.23¼	.16	.19½
Cyanide, 100 lb drs (A)	lb.	.34	.38	.34	.38	.34	.38
Oleate, precip, bbls	lb.	.22	.29½	.20	.29½	...	.20
Oxide, bl, bbls, wks (A)	lb.	.19½	.21	.19½	.21	.18	.21
red 100 lb bbls	lb.	.20	.22	.20	.22	.19	.22
Sub-acetate verdigris, 400 lb bbls	lb.	.18	.19	.18	.19	.18	.19
Sulfate, bbls, c-l, wks, (A)	100 lb.	5.15	5.50	5.15	5.50	4.75	5.50
Copperas crys and sugar bulk c-l, wks	ton	...	17.00	...	17.00	14.00	17.00
Corn sugar, tanners, bbls	100 lb.	...	3.54	3.54	4.05	3.36	4.05
Corn Syrup, 42°, bbls	100 lb.	...	3.69	3.52	3.69	3.42	3.52
43°, bbls	100 lb.	...	3.74	3.57	3.74	3.47	3.57
Cotton, Soluble, wet 100 lb bbls	lb.	.40	.42	.40	.42	.40	.42
Cream Tartar, powd & gran 300 lb bbls	lb.	...	.57½	...	.57½	.38¼	.57½
Creosote, USP 42 lb cbys	lb.	.60	.77	.60	.77	.45	.77
Oil, Grade 1 tks	gal.	...	.15½	...	.15½	.13½	.15½
Grade 2	gal.	.122	.132	.122	.132	.122	.132
Cresol, USP, drs, c-l (A)	lb.	.10¾	.11¼	.10¾	.11½	.09¾	.11¼
Crotonaldehyde, 97%, 55 and 110 gal drs, wks	lb.	...	.15	...	.15	.11	.15
Cutch, Philippine, 100 lb bale	lb	no supplies		...	.05¼	.04¼	.05¼
Cyanamid, pulv, bgs, c-l, frt (A) all'd, nitrogen basis, unit		1.52½ nom.		no prices		...	1.40
D							
Derris root 5% rotenone, bbls	lb.	...	.35	.40	.45	.21	.40
Dextrin, corn, 140 lb bgs f.o.b., Chicago	100 lb.	...	4.00	...	4.00	3.80	4.00
British Gum, bgs	100 lb.	...	4.25	...	4.25	4.05	4.25
Potato, Yellow, 220 lb bgs	lb.	...	.10	.09½	.10	.08	.08½
White, 220 lb bgs, lcl	lb.	.09½	.11¾	.09½	.11¾	.08½	.09
Tapioca, 200 bgs, lcl	lb.	...	.0715	...	.0715	...	.0715
White, 140 lb bgs	100 lb.	...	3.95	...	3.95	3.75	3.95
Diamylamine, c-l, drs, wks	lb.	...	.61	.50	.61	.47	.50
lcl drs, wks	lb.	...	.64	.53	.64	.48	.53
Diamylene, drs, wks	lb.	...	.105	...	.105	.095	.105
lcl, drs	lb.	...	.112	...	.112	...	...
tks, wks	lb.	...	.09½	...	.09½	.08½	.09½
Diamylether	lb.	...	...	...	...	.085	.102
lcl, drs	lb.	...	.112	.102	.112	...	...
c-l, drs	lb.	...	.105	.095	.105	...	...
tks	lb.	...	.095	.085	.095	...	...
Diamylnaphthalene, lcl, drs, f.o.b. wks	lb.	...	.17	...	.17	.17	.20
Diamylphenol, lcl, drs	lb.	...	.21	...	.21	...	...
Diamylphthalate, drs, wks	lb.	...	.22	.21	.22	.21	.21½
Diamyl Sulfide, drs, lcl	lb.	...	.25	...	.25	...	...
Diatomaceous Earth, see Kieselguhr.							
Dibutoxy Ethyl Phthalate, drs, wks	lb.	...	.35	...	.35	...	.35
Dibutylamine, lcl, drs, wks	lb.	...	.64	.53	.64	...	.53
c-l, drs, wks	lb.	...	.61	.50	.61	...	.50
tks, wks	lb.	...	.59	.48	.59	...	.48
Dibutyl Ether, drs, wks, lcl	lb.	.26	.28	.26	.28	.25	.28
Dibutylphthalate, drs, wks, frt all'd	lb.	.21	.23½	.21	.23½	.19	.20
Dibutyltartrate, 50 gal drs	lb.	...	.92	.87	.92	.50	.87
Dichlorethylene, drs	lb.	...	.25	...	.25	...	.25
Dichloroethylether, 50 gal drs. wks (A)	lb.	.15	.16	.15	.16	.15	.16
tks, wks	lb.	...	.14	...	.14	...	.14
Dichloromethane, drs, wks	lb.	...	.23	...	.23	...	.23
Dichloropentanes, c-l, drs	lb.	...	.037	...	.037	.025	.04
lcl, drs	lb.	...	.045	...	.045	...	...
tks, wks	lb.	...	.03	...	.03	.0221	.025

* These prices were on a delivered basis.

	Current Market	1942 Low	1942 High	1941 Low	1941 High
Diethanolamine, tks ,wks lb.	...	.22½	...	.22½	...	.22½
Diethylamine, 300 lb drs, lcl, f.o.b., wks .....lb.	...	.81	.70	.81	...	.70
Diethylamino Ethanol, lcl, drs, f.o.b. Wyandotte, frt all'd E. Miss .....lb.	...	.85	.75	.85	...	.75
Diethylaniline, 850 lb drs lb.	...	.40	...	.40	...	.40
Diethylcarbonate, com drs lb.	...	.25	...	.25	...	.25
Diethylorthotoluidin, drs .lb.	.64	.67	.64	.67	.64	.67
Diethylphthalate, c-l, drs ..lb.	...	.22	.21½	.22	.19	.20
Diethylsulfate, tech, drs, wks, lcl .....lb.	.13	.14	.13	.14	.13	.14
Diethyleneglycol, drs ....lb.	.14	.15½	.14	.15½	.14	.15½
Mono ethyl ether, drs ..lb.	.14½	.15½	.14½	.15½	.14½	.15½
tks, wks .....lb.	...	.13½	...	.13½	...	.13½
Mono butyl ether, drs ..lb.	.22½	.24½	.22½	.24½	.22½	.24½
tks, wks .....lb.	...	.22	...	.22	...	.22
Diethylene oxide, 50 gal drs, wks .....lb.	.20	.24	.20	.24	.20	.24
Diglycol Laurate, bbls ...lb.	.31	.33	.16	.33	...	.16
Oleate, bbls .....lb.	...	.17	...	.17	...	.17
Stearate, bbls .....lb.	...	.22	...	.22	...	.22
Dimethylamine, 400 lb drs, pure 25 & 40% sol 100% basis .....lb.	.85	.90	.85	.90	.85	1.05
Dimethylaniline, 240 lb drs lb.	.23	.24	.23	.24	.23	.24
Dimethyl phthalate, drs, wks, frt all'd .....lb.	...	.20	...	.20	.18½	.20
Dimethylsulfate, 100 lb drs lb.	.45	.50	.45	.50	.45	.50
Dinitrobenzene, 400 lb bbls lb.	...	.18	...	.18	...	.18
Dinitrochlorobenzene, 400 lb bbls .....lb.	...	.14	...	.14	...	.14
Dinitronaphthalene, 350 lb bbls .....lb.	.35	.38	.35	.38	.35	.38
Dinitrophenol, 350 lb bbls lb.	...	.22	...	.22	...	.22
Dinitrotoluene, 300 lb bbls lb.	...	.18	...	.18	.15½	.18
Diphenyl, bbls .....lb.	...	.15	...	.15	.15	.20
Diphenylamine (A) .....lb.	...	.25	...	.25	...	.25
Diphenylguanidine, 100 lb drs (A) .....lb.	.35	.37	.35	.37	.35	.37
Dip Oil, see Tar Acid Oil.						
Divi Divi pods, bgs shipmt ton	...	80.00	55.00	80.00	32.00	52.00
Extract .....lb.	.05¾	.06¾	.05¾	.06¾	.05¾	.06¾
Drymet (see sodium metasilicate anhydrous).						
E						
Egg Yolk, dom., 200 lb. cases lb.	.98	1.00	.87	1.05	.60	1.05
Epsom Salt, tech, 300 lb bbls c-l, NY .....100 lb.	...	1.90	...	1.90	...	1.90
USP, c-l, bbls .....100 lb.	...	2.00	2.00	2.10	...	2.10
Ether, USP anaesthesia 55 lb drs .....lb.	.60	.61	.52	.61	.26	.53
Isopropyl 50 gal drs ...lb.	.07	.08	.07	.08	.07	.08
tks, frt all'd .....lb.	...	.06		.06	...	.06
Nitrous conc bottles ...lb.	.93	1.10	.73	1.10	...	.73
Synthetic, wks, tks .....lb.	...	.12½	.08	.12½	.08	.09
Ethyl Acetate, 85% Ester tks, frt all'd .....lb.	.11	.12	.11	.12	.06½	.12
drs, frt all'd .....lb.	.12	.13	.12	.13	.07½	.13
99%, tks, frt all'd ...lb.	.11¼	.12¼	.11¼	.12¼	.06¾	.13¼
drs, frt all'd .....lb.	.12¼	.13¼	.12¼	.13¼	.07¾	.13¼
Acetoacetate, 110 gal drs lb.	...	.37½	..	.37½	.27½	.37½
Benzylaniline, 300 lb drs lb.	.86	.88	.86	.88	.86	.88
Bromide, tech drs .....lb.	.50	.55	.50	.55	.50	.55
Cellulose, drs, wks, frt all'd .....lb.	.50	.60	.50	.60	.45	.50
Chloride, 200 lb drs ....lb.	.18	.20	.18	.20	.18	.20
Chlorocarbonate, cbys ..lb.	...	.30	...	.30	...	.30
Crotonate, drs .....lb.	...	.35	...	.35	...	.35
Formate, drs, frt all'd ..lb.	...	.27¼	...	.27¼	.25	.27¼
Lactate, drs, wks .....lb.	...	.33½	...	.33½	...	.33½
Oxalate, drs, wks .....lb.	...	.33	...	.33	.25	.33
Silicate, drs, wks .....lb.	...	.77	...	.77	...	.77
Ethylene Dibromide, 60 lb drs .....lb.	.65	.70	.65	.70	.65	.70
Chlorhydrin, 40%, 10 gal cbys chloro, cont ....lb.	.75	.85	.75	.85	.75	.85
Anhydrous .....lb.	...	.75	...	.75	...	.75
Dichloride, (*FP*) 50 gal drs, E. Rockies .....lb.	...	.0742	...	.0742	.0693	.0746
Glycol, 50 gal drs, wks lb.	...	.15½	.14½	.18½	.14½	.18½
tks, wks (A) .....lb.	...	.14½	.13½	.14½	...	.13½
Mono Butyl Ether, drs, wks .....lb.	.16½	.17½	.16½	.17½	.16½	.17½
tks, wks .....lb.	...	.15½	...	.15½	...	.15½
Mono Ethyl Ether, drs wks .....lb.	.14½	.15½	.14½	.15½	.14½	.15½
tks, wks .....lb.	...	.13½	...	.13½	...	.13½
Mono Ethyl Ether Acetate, drs, wks .... lb.	.11½	.12½	.11½	.12½	.11½	.12½
tks, wks .....lb.	...	.10½		.10½	...	.10½
Mono Methyl Ether, drs wks . .....lb.	.15½	.16½	.15½	.16½	.15½	.16½
tks, wks .....lb.		.14½		.14½		.14½
Oxide, cyl .....lb.	.50	.55	.50	.55	.50	.55
Ethylideneaniline .....lb.	.45	.47½	.45	.47½	.45	.47½
F						
Feldspar, blk pottery ....ton	17.00	19.00	17.00	19.00	17.00	19.00
Powd, blk wks .....ton	14.00	17.50	14.00	17.50	14.00	17.50
Ferric Chloride, tech, crys, 475 lb bbls .....lb.	.05	.07½	.05	.07½	.05	.07½
sol, 42° cbys .....lb.	.06½	.07	.06½	.07	.06½	.07

l + 10; *m* + 50; * Bbls. are 20c higher
FP Full Priority. *PC* Price Ceiling. (A) Allocation

	Current Market	1942 Low	1942 High	1941 Low	1941 High
Fish Scrap, dried, unground wks (*PC*) unit *l*	...	5.00	4.75	4.85	4.35	4.85
Acid, Bulk, 6 & 3%, delv Norfolk & Baltimore basis unit *m*	....	4.50	2.75	4.50	2.75	3.25
Fluorspar, 98% bgs (*PC*) ton	28.00	32.00	28.00	34.00	29.00	34.00
Formaldehyde, c-l, bbls, wks (*FP*, *PC*) lb.	.055	.0575	.055	.0575	...	...
Fossil Flour lb.	.02½	.04	.02½	.04	.02½	.04¼
Fullers Earth, blk, mines ton	8.50	15.00	8.50	15.00	8.50	15.00
Imp powd, c-l, bgs ton	30.00	40.00	30.00	40.00	no prices	
Furfural (tech) drs, wks lb.	.15	.20	.15	.20	.10	.15
tks, wks lb.	...	.09	...	.09	...	.09
Furfuramide (tech) 100 lb drs lb.	...	.30	...	.30	...	.30
Fusel Oil, 10% impurities lb.	.18	.19½	.18	.19½	.16	.19½
Fustic, crystals, 100 lb boxes lb.	.28	.32	.28	.32	.24	.32
Liquid 50°, 600 lb bbls lb.	.12½	.16	.12½	.16	.10½	.16
Solid, 50 lb boxes lb.	.19	.21	.19	.21	.19	.21
G						
G Salt paste, 360 lb bbls lb.	...	.45	...	.45	...	.45
Gambier, com 200 lb bgs lb.	no prices		...	.09½	.06½	.09½
Singapore cubes, 150 lb bgs 100 lb.	.30	nom.	.12½	.30	.08¼	.11
Glauber's Salt, tech, c-l, bgs, wks 100 lb.	1.05	1.28	1.05	1.28	.95	1.28
Anhydrous, see Sodium Sulfate						
Glue, bone, com grades, c-l bgs lb.	.15½	.18½	.15½	.18½	.13½	.18½
Better grades, c-l, bgs lb.	.19	.30	.19	.30	.15	.30
Glycerin (*PC*) CP, drs lb.	...	.18¼	...	.18¼	.14½	.19½
Dynamite, 100 lb drs lb.	...	.18¼	...	.18¼	...	.18¼
Saponification, drs lb.	...	.12¾	...	.12¾	.09½	.20½
Soap Lye, drs lb.	...	.11½	...	.11½	.07½	.18
Glyceryl Bori-Borate, bbls lb.	...	.40	...	.40	...	.40
Monoricinoleate, bbls lb.	...	.27	...	.27	...	.27
Monostearate, bbls lb.	...	.30	...	.30	...	.30
Oleate, bbls lb.	...	.22	...	.22	...	.22
Phthalate lb.	...	.38	...	.38	...	.38
Glyceryl Stearate, bbls lb.	...	.18	...	.18	...	.18
Glycol Bori-Borate, bbls lb.	...	.22	...	.22	...	.22
Phthalate, drs lb.	...	.38	...	.38	...	.38
Stearate, drs lb.	...	.26	...	.26	...	.26
GUMS						
Gum Aloes, Barbadoes lb.	.80	.85	.80	.85	.80	.95
Arabic, amber sorts lb.	.16	.17	.16	.24	.14	.25
White sorts, No. 1, bgs lb.	.33	.35	.33	.35	.35	.45
Powd, bbls lb.	.22	.23	.22	.28	.18	.30
Asphaltum, Barbadoes (Manjak) 200 lb bgs, f.o.b. NY lb.	.05¼	.12	.04½	.12	.04½	.05½
California, f.o.b. NY, drs ton	35.00	40.00	20.00	40.00	20.00	36.50
Egyptian, 200 lb cases, f.o.b. NY lb.	.12	.15	.12	.15	.12	.15
Benzoin Sumatra, USP, 120 lb cases lb.	.50	.55	.45	.55	.19	.50
Copal, Congo, 112 lb bgs, clean, opaque lb.	...	.49½	...	.49½	...	.49½
Dark amber lb.	...	.12¾	...	.12¾	...	.12¾
Light amber lb.	...	.17	...	.17	...	.17
Copal, East India, 180 lb bgs Macassar pale bold lb.	...	.17⅜	...	.17⅜	.12¾	.17⅜
Chips lb.	...	.11½	...	.11½	.06¾	.11½
Dust lb.	...	.07	...	.07	.05¼	.07
Nubs lb.	...	.13⅜	...	.13⅜	.10½	.13⅜
Singapore, Bold lb.	...	.22⅜	...	.22⅜	.15¾	.22⅜
Chips lb.	...	.12⅜	...	.12⅜	.08½	.12⅜
Dust lb.	...	.07	...	.07	.05¼	.07
Nubs lb.	...	.17¾	...	.17¾	.11	.17¾
Copal Manila, 180-190 lb. (A)	...	.14½	.14	.14½	.13⅞	.14
Loba B lb.	...	.13¾	.13¾	.14¼	.11¾	.14¼
Loba C lb.	...	.13⅜	.13⅜	.13⅞	.11¼	.13⅞
DBB lb.	...	.11	.11	.12¼	.10	.12¼
MA sorts lb.	...	.09¾	.09¾	.10¼	.07¾	.10¼
Copal Pontianak, 224 lb cases, bold gen. (A) lb.	...	.22⅜	.22⅜	.22⅞	.15⅜	.22⅞
Chips lb.	...	.12⅜	.12⅜	.14½	.10	.14½
Mixed lb.	...	.17⅜	.17⅜	.17⅞	.14⅜	.17⅞
Nubs lb.	...	.18⅜	.18⅜	.18⅞	.12¾	.18⅞
Split lb.	...	.19⅛	.19⅛	.19⅝	.13¾	.19⅝
Damar Batavia, 136 lb cases (A) A lb.	...	.35¼	...	.35¼	.21⅜	.35¼
B lb.	...	.34⅛	...	.34⅛	.20¼	.34⅛
C lb.	...	.28⅛	...	.28⅛	.14⅜	.28⅛
D lb.	...	.25⅝	...	.25⅝	.13¼	.25⅝
A/D lb.	...	.28⅛	...	.28⅛	.15¼	.28⅛
A/E lb.	...	.25⅝	...	.25⅝	.12⅞	.25⅝
E lb.	...	.18¾	...	.18¾	.10	.18¾
F lb.	...	.13¾	...	.13¾	.08	.13¾
Singapore, No. 1 lb.	...	.30⅝	...	.30⅝	.16⅝	.30⅝
No. 2 lb.	...	.25⅛	...	.25⅛	.12¼	.25⅛
No. 3 lb.	...	.12⅛	...	.12⅛	.07⅛	.12⅛
Chips lb.	...	.23½	...	.23½	.11	.23½
Dust lb.	...	.13	...	.13	.07½	.13
Seeds lb.	...	.17¾	...	.17¾	.09⅞	.17¾
Elemi, cns, c-l (A) lb.	...	.08⅞	...	.08⅞	.08½	.08⅞
Ester lb.	...	.09½	.08½	.09½	.06¼	.09½
Gamboge, pipe, cases lb.	2.30	2.35	.95	2.35	.95	1.00
Powd, bbls lb.	2.50	2.55	1.05	2.55	1.05	1.10
Ghatti, sol, bgs lb.	.11	.15	.11	.15	.11	.15
Karaya, bbls, bxs, drs lb.	.14	.33	.14	.33	.14	.33

FP Full Priority. *PC* Price Ceiling. (A) Allocation

Kauri, NY
Logwood

Prices

	Current Market		1942 Low	1942 High	1941 Low	1941 High
Kauri, N Y (A)						
Brown XXX, cases ....lb.	...	.77	.60	.77	...	.67
BX ....lb.	...	.38	...	.38	...	.38
B1 ....lb.	...	.34	.28	.34	...	.28
B2 ....lb.	...	.30	.24	.30	...	.24
B3 ....lb.	...	.27½	.18½	.27½	...	.18½
Pale XXX ....lb.	...	.66	.61	.66	...	.61
No. 1 ....lb.	...	.43	.41	.43	...	.41
No. 2 ....lb.	...	.31	.24	.31	...	.24
No. 3 ....lb.	...	.22	.17¾	.22	...	.17¾
Kino, tins ....lb.	no prices		no prices		no prices	
Mastic ....lb.	3.50	3.75	3.25	3.75	1.50	3.30
Sandarac, prime quality, 200 lb bgs & 300 lb cks ..lb.	.95	.97½	.95	1.10	.50	1.10
Senegal, picked bgs ....lb.	...	.30	...	.30	...	.30
Sorts ....lb.	...	.13	...	.13	...	.13
Thus, bbls ....280 lbs.	...	16.50	...	16.50	15.00	16.50
Tragacanth, No. 1, cases ..lb.	3.75	4.00	3.50	4.00	2.75	3.40
No. 2 ....lb.	2.00	3.00	2.00	3.00	2.45	2.80
No. 3 ....lb.	1.10	1.20	1.10	1.20	1.10	2.60
Yacca, bgs (*PC*) ....lb.	.06	.07½	.06	.07¾	.03½	.07¾
H						
Hematine crys, 400 lb bbls lb.	.24	.34	.24	.34	.20	.34
Hemlock, 25%, 600 lb bbls wks ....lb.	...	.0385	.03½	.0385	.03½	.03½
tks ....lb.	...	.0325	.03	.0325	.02¾	.03
Hexalene, 50 gal drs, wks lb.	...	.23	...	.23	.23	.30
Hexane, normal 60-70° C. Group 3, tks (*PC*) ..gal.	...	.11	...	.11	.09¾	.11
Hexamethylenetetramine, powd, drs (*FP*) ....lb.	.32	.33	.32	.33	.32	.33
Hexyl Acetate, secondary, delv, drs ....lb.	.13	.13½	.13	.13½	.13	.13½
tks ....lb.	...	.12	...	.12	...	.12
Hoof Meal, f.o.b. Chicago unit	4.00	4.50	3.00	4.50	2.65	3.05
Hydrogen Peroxide, 100 vol, 140 lb cbys ....lb.	.16	.18½	.16	.18½	.16	.18½
Hydroxylamine Hydrochloride ....lb.	...	3.15	...	3.15	...	3.15
Hypernic, Bags, No. 1 ...lb.	...	.42	...	.42	.40	.42
I						
Indigo, Bengal, bbls ....lb.	2.14	2.20	2.14	2.20	1.63	2.20
Synthetic, liquid ....lb.	.16½	.19	.16½	.19	.16½	.19
Iodine, Resublimed, jars ..lb.	...	2.00	...	2.00	...	2.00
Irish Moss, ord, bales ...lb.	.37	.42½	.30	.42½	.25	.31
Bleached, prime, bales ..lb.	.80	.85	.80	.85	.32	.46
Iron Acetate Liq. 17°, bbls delv ....lb.	.03	.04	.03	.04	.03	.04
Chloride see Ferric Chloride						
Nitrate, coml, bbls 100 lb.	3.50	4.00	3.50	4.00	3.50	4.00
Isobutyl Carbinol (128-132°C) drs, f.o.b. Wyandotte, Mich. ....lb.	...	.23½	...	.23½	.22½	.23½
tks, ...lb.	...	.21½	...	.21½	...	.21½
Isopropyl Acetate, tks, frt all'd ....lb.	...	.10	.076	.10	.06½	.07½
drs, frt all'd, c-l ....lb.	...	.12	.086	.12	.07½	.08½
Ether, see Ether, isopropyl						
K						
Keiselguhr, dom bags, c-l, Pacific Coast ....ton	22.00	25.00	22.00	25.00	22.00	25.00
L						
Lead Acetate, f.o.b. NY, bbls, (*PC*) White, broken ....lb.	...	.12½	.12	.13¼	.11	.12½
cryst, bbls ....lb.	...	.12½	.12	.13¼	.11	.12½
gran, bbls ....lb.	...	.13¼	.12¾	.14	.11¾	.13¼
powd, bbls ....lb.	...	.13¼	.12¾	.14	.11¾	.13¼
Arsenate, East, drs ....lb.	.11	.12	.11	.12	.09	.11
Linoleate, solid, bbls ..lb.	...	.22½	.19	.22½	...	.19
Metal, c-l, NY (*FP*) 100 lb.	5.85	5.90	5.85	5.90	5.70	5.90
Nitrate, 500 lb bbls, wks lb.	.11	.14	.11	.14	.11	.14
Oleate, bbls ....lb.	...	.17¾	.17¾	.20	.18½	.20
Red, dry, 95% Pb_3O_4, delv ....lb.	...	.09	.	09	.08	.08¾
97% Pb_3O_4, delv ....lb.	...	.09½	.09¼	.09½	.084	.086
98% Pb_3O_4, delv ....lb.	...	.10½	.09½	.10½	.0865	.0885
Resinate, fused, bbls ...lb.	.10	.12	.09½	.12	.09½	.16½
Stearate, bbls ....lb.	...	.25	...	.25	...	.25
Titanate, bbls, c-l, f.o.b. wks, frt all'd ....lb.	...	.10¼	...	.10¼	...	.10¼
White, 500 lb bbls, wks, lb.	...	.07½	...	.07½	...	.07½
Basic sulfate, 500 lb bbls, wks ....lb.	...	.07½	.06¾	.07½	.06½	.07
Lecithin, ed, dms, cl ....lb.	...	.34	...	...	...	...
tech, dms, cl ....lb.	...	.28	...	...	...	...
Lime, chemical quicklime, f.o.b. wks, bulk ....ton	7.00	13.00	7.00	13.00	7.00	13.00
Hydrated, f.o.b. wks ..ton	8.50	16.00	8.50	16.00	8.50	16.00
Lime Salts, see Calcium Salts						
Lime, sulfur, dealers, tks gal.	no prices		.07½	.08½	...	.07½
drs ....gal.	no prices		.10	.14	.10	.14
Linseed Meal, bgs ..... ton	...	36.00	33.50	36.00	23.00	33.00
Litharge, coml, delv, bbls lb.	...	.08	.079	.08	.07	.0760
Lithopone, dom, ordinary, (*PC*). delv, bgs .....lb.	...	.04¼	...	.04¼	.0385	.04¼
bbls ....lb.	...	.04½	...	.04½	.041	.04½
Titanated, bgs ....lb.	...	.056	...	.056	.05¼	.056
bbls ....lb.	...	.0585	...	.0585	.05½	.0585
Logwood, 51°, 600 lb bbls lb.	...	.13	...	.13	.10½	.13
Solid, 50 lb boxes .. lb.	...	.22	...	.22	.16½	.22

(*FP*) Full Priority. (*PC*) Price Ceilng. (A) Allocation

	Current Market	1942 Low	1942 High	1941 Low	1941 High
M					
Madder, Dutch ..... lb.	.24	.30	.22	.30	.22	.25
Magnesite, calc, 500 lb bbls ton	83.00	88.00	74.00	88.00	65.00	80.00
Magnesium Carb, tech, 70 lb bgs, wks ..... lb.	...	.06¼	...	.06¼	...	.06¼
Chloride flake, 375 lb bbls, c-l, wks ..... ton	...	32.00	...	32.00	...	32.00
Metal, Ingots, c-l ..... lb.	...	.27	...	.27	...	...
Oxide, calc tech, heavy bbls, frt all'd ..... lb.	...	.26	...	.26	...	.26
Light bbls above basis lb.	...	.26	...	.26	...	.26
USP Heavy, bbls, above basis ..... lb.	...	.26	...	.26	...	.26
Palmitate, bbls ..... lb.	.33	.35	.33	.35	.33	.35
Silicofluoride, bbls .... lb.	.18	.20	.18	.25	.11	.25
Stearate, bbls ..... lb.	.31	.32	.31	.33	.23	.31
Manganese, acetate, drs .. lb.	...	.26½	...	.26½	...	.26½
Borate, 30%, 200 lb bbls lb.	.15	.17	.15	.17	.15	.16
Chloride, bbls ..... lb.	...	.13	.13	.14	...	.14
Dioxide, tech (peroxide), paper bgs, c-l ..... ton	...	74.75	70.00	74.75	...	71.50
Hydrate, bbls ..... lb.	...	.82	...	.82	...	.82
Linoleate, liq. drs ..... lb.	...	.20	.18	.20	.18	.19½
solid, precip, bbls .... lb.	...	.22	.19	.22	...	.19
Resinate, fused bbls ... lb.	.09	.10½	.08¼	.10½	.08¼	.08½
precip, drs ..... lb.	.14½	.15½	.12	.15½	...	.12
Sulfate, tech, anhyd, 90-95%, 550 lb drs .... lb.	...	.11¼	.10½	.11½	.10½	.11½
Mangrove, 55%, 400 lb bbls lb.						
Bark, African ..... ton	no prices		no prices		34.00	38.00
Mannitol, pure cryst, cs, wks lb.	...	.85	...	.85	.85	.90
commercial grd, 250 lb bbls ..... lb.	...	.40	...	.40	.35	.45
Marble Flour, blk ..... ton	12.50	14.50	12.50	14.50	12.00	14.50
Mercury chloride (Calomel) lb.	...	2.95	...	2.95	2.70	2.95
Mercury metal ..76 lb. flasks	191.00	193.00	191.00	210.00	167.00	215.00
Mesityl Oxide, f.o.b. dest, tks ..... lb.	...	.10½	...	.10½	.10½	.15
drs, c-l ..... lb.	...	.12½	.11½	.12½	.11½	.16
drs, lcl ..... lb.	...	.13	.12	.13	.12	.16½
Meta-nitro-aniline ..... lb.	.67	.69	.67	.69	.67	.69
Meta-nitro-paratoluidine 200 lb bbls ..... lb.	1.05	1.10	1.05	1.10	1.05	1.10
Meta-phenylene diamine 300 lb bbls ..... lb.	...	.65	...	.65	...	.65
Meta-toluene-diamine 300 lb bbls ..... lb.	...	.70	...	.70	.65	.70
Methanol, denat, grd. drs, c-l frt all'd (*PC*) gal.	...	.66	...	.66	.60	.66
tks, frt all'd ..... gal.	...	.60	...	.60	...	.60
Pure, nat, drs, c-l, frt all'd ..... gal. *a*	.55½	.61½	.55½	.61½	.35½	.55½
tks, nat ..... gal. *a*	.50	.54½	.50	.54½	.30	.50
Synth, pure, drs .... gal. *b*	.34½	.40½	.34½	.40½	...	...
tks, synth ..... gal. *b*	.28	.32½	.28	.32½	...	...
Methyl Acetate, tech tks, delv ..... lb.	.06	.07	.06	.07	.06	.07
55 gal drs, delv ..... lb.	.11	.12½	.11	.12½	.07	.12½
C.P. 97-99%, tks, delv lb.	.09½	.10½	.09½	.10½	.09½	.10½
55 gal drs, delv ..... lb.	.10½	.13	.10½	.13	.10½	.13
Acetone, frt all'd, drs gal. *p*	...	.81	...	.81	.37½	.81
tks, frt all'd ..... gal. *p*	...	.75	...	.75	.32	.75
Synthetic, frt, all'd, drs ..... gal. *p*	.51	.54½	.51	.54½	.37½	.51
tks, frt all'd ...gal.	.43	.45½	.43	.45½	.32	.43
Anthraquinone ..... lb.	...	.83	...	.83	...	.83
Butyl Ketone, tks ..... lb.	...	.10½	...	.10½	...	.10½
Cellulose, 100 lb. lots, frt all'd ..... lb.	.50	.55	.50	.55	...	.55
less than 100 lbs. f.o.b. wks ..... lb.	...	.60	...	.60	...	.60
Chloride, 90 lb. cyl .... lb.	.32	.40	.32	.40	.32	.40
Ethyl Ketone, tks, frt all'd lb.	...	.08	...	.08	.06	.08
50 gal drs, frt all'd, c-l lb.	...	.09½	...	.09½	.07	.09½
Formate, drs, frt all'd ..lb.	...	.89	...	.89	...	.89
Hexyl, Ketone, pure, drs lb.	...	.60	...	.60	...	.60
Lactate, drs, frt all'd ...lb.	...	.70	...	.70	.70	.80
Mica, dry grd, bgs, wks ..ton	...	30.00	...	30.00	...	30.00
Michler's Ketone, kgs ....lb.	...	2.50	...	2.50	...	2.50
Mixed Amylnaphthalenes mixed, ref., l-c-l, drs, f.o.b. wks ..... lb.	...	.16	...	.16	.16	.19
crude ..... lb.	...	.14	...	.14	.14	.15
Monoamylamine, c-l, drs, wks lb.	...	.61	.50	.61	.50	.52
lcl. drs, wks on (100% basis) ..... lb.	...	.64	...	.64	...	.55
Monoamylnaphthalene, l-c-l, drs, f.o.b. wks ..... lb.	...	.17	...	.17	.17	.20
Monobutylamine, drs (100% basis) c-l, wks ..... lb.	...	.48	.40	.48	...	.40
l-c-l, wks ..... lb.	...	.51	.51	.64	...	.48
Monochlorobenzene, see "C"						
Monoethanolamine, tks, wks, lb.	...	.23	...	.23	...	.23
Monoethylamine (100% basis) lcl, drs, f.o.b. wks ..... lb.	...	.46	...	.46	.35	.65
Monomethylamine, drs, frt all'd, E. Mississippi, c-l lb.	...	.65	...	.65	...	.65
Monomethylparamiosulfate, 100 lb drs ..... lb.	3.75	4.00	3.75	4.00	3.75	4.00
Morpholine, drs 55 gal, wks ..... lb.	...	.67	...	.67	...	.67

a Producers of natural methanol divided into two groups and prices vary for these two divisions; *b* Country is divided in 4 zones, prices varying by zone: *p* Country is divided into 4 zones.

(*FP*) Full Priority. (*PC*) Price Ceiling.

Myrobalans
Para Toluidine

Prices

	Current Market	1942 Low	1942 High	1941 Low	1941 High
Myrobalans 25%, liq bbls lb.	no prices	no prices		no prices	
50% Solid, 50 lb boxes lb.	no prices	no prices		no prices	
J1 bgs ton	no prices	no prices		35.00	48.00
J2 bgs ton	no prices	no prices		28.00	39.00
N					
Naphtha, v.m.&p. (deodorized) see petroleum solvents.					
Naphtha, Solvent, water-white, tks gal.	...	.27	...	.27	...	.26
drs, c-l gal.	...	.31	...	.31	...	.31
Naphthalene, dom, crude bgs. wks lb.	2.75	3.00	2.50	3.00	2.25	2.75
Balls, flakes, pks lb.	...	.08	...	.08	.06¼	.08
Balls, ref'd bbls, wks lb.	...	.08	...	.08	.07	.08
Flakes, re'd, bbls, wks lb.	...	.08	...	.08	.07	.08
Nickel Carbonate, bbls (A) lb.	.36	.36½	.36	.36½	.36	.36½
Chloride, bbls lb.	.18	.20	.18	.20	.18	.20
Metal ingot lb.	.35	.36	.35	.36	.34	.36
Oxide, 100 lb kgs, NY lb.	.35	.38	.35	.38	.35	.38
Salt, 400 lb bbls, NY lb.	.13	.13½	.13	.13½	.13	.13½
Nicotine, sulfate, 40%, drs, 55 lb drs lb.	...	.703	...	.703	...	.703
Nitre Cake, blk ton	...	16.00	...	16.00	...	16.00
Nitrobenzene redistilled, 1000 lb drs, wks lb.	.08	.09	.08	.09	.08	.09
tks lb.	...	.07	...	.07	...	.07
Nitrocellulose, c-l, lcl, wks lb.	.20	.29	.20	.29	.20	.29
Nitrogen Sol. 45½% ammon, f.o.b. Atlantic & Gulf ports, tks, unit ton, N basis	...	1.2158	...	1.2158	...	1.2158
Nitrogenous Mat'l, bgs imp unit	no prices		no prices		no prices	
dom, Eastern wks unit	...	3.00	2.75	3.50	2.20	3.00
dom, Western wks unit	...	2.50	2.60	3.35	1.75	2.60
Nitronaphthalene, 550 lb bbls lb.	.24	.25	.24	.25	.24	.25
Nutgalls Alleppo, bgs lb.	no prices		no prices		.26	.29
O						
Oak Bark Extract, 25%, bbls lb.	...	.0385	.03½	.03¾	.03⅛	.03¾
tks lb.	...	.0325	.02	.0325	.02¾	.03
Octyl Acetate, tks, wks lb.	...	.15	...	.15	...	.15
Orange-Mineral, 1100 lb cks NY lb.	...	.12	...	.12	.11	.11½
Orthoaminophenol, 50 lb kgs lb.	2.15	2.25	2.15	2.25	2.15	2.25
Ortho amyl phenol, l-c-l, drs, f.o.b. wks lb.	...	.25	...	.25	.15	.25
Orthoanisidine, 100 lb drs lb.	...	.70	...	.70	...	.70
Orthochlorophenol, drs lb.	...	.32	...	.32	...	.32
Orthocresol, 30.4°, drs, wks (A) lb.	.17½	.18	.17	.18	.16	.17½
Orthodichlorobenzene, 1000 lb drs lb.	.06	.07½	.06	.07½	.06	.07½
Orthonitrochlorobenzene, 1200 lb drs, wks lb.	.15	.16	.15	.18	.15	.18
Orthonitroparachlorphenol, tins lb.	...	.75	...	.75	...	.75
Orthonitrophenol, 350 lb drs lb.	.85	.90	.85	.90	.85	.90
Orthonitrotoluene, 1000 lb drs, wks lb.	...	.09	...	.09	...	.09
Orthotoluidine, 350 lb bbls, lcl lb.	...	.19	...	.19	...	.19
Osage Orange, cryst, bbls lb.	...	.23	...	.23	.21	.23
51° liquid lb.	...	.10	...	.10	...	.10
P						
Paraffin, rfd, 200 lb bgs (*PC*) 122-127° M P lb.	...	.052	...	.052	.04¼	.057
128-132° M P lb.	.056	.0585	.056	.0585	.057	.0595
133-137° M P lb.	.0615	.0640	.0615	.0640	.06¼	.06½
Para aldehyde, 99%, tech, 55-110 gal drs, wks lb.	...	.12	...	.12	.10	.12
Aminoacetanilid, 100 lb kgs lb.	...	.85	...	.85	...	.85
Aminohydrochloride, 100 lb kgs lb.	1.25	1.30	1.25	1.30	1.25	1.30
Aminophenol, 100 lb kgs lb.	...	1.05	...	1.05	...	1.05
Chlorophenol, drs lb.	...	.32	...	.32	...	.32
Dichlorobenzine 200 lb drs, wks lb.	.11	.12	.11	.12	.11	.12
Formaldehyde, drs, wks (*FP*) lb.	.23	.24	.23	.24	.23	.24
Nitroacetanilid, 300 lb bbls lb.	.45	.52	.45	.52	.45	.52
Nitroaniline, 300 lb bbls, wks lb.	...	.45	...	.45	...	.45
Nitrochlorobenzene, 1200 lb drs, wks lb.	...	.15	...	.15	...	.15
Nitro-orthotoluidine, 300 lb bbls lb.	2.75	2.85	2.75	2.85	2.75	2.85
Nitrophenol, 185 lb bbls lb.	...	.35	...	.35	...	.35
Nitrosodimethylaniline, 120 lb bbls lb.	.92	.94	.92	.94	.92	.94
Nitrotoluene, 350 lb bbls lb.	...	.30	...	.30	...	.30
Pentaerythritol, tech, bbls, delv lb.	.33½	.35½	.33½	.35½	...	...
Phenylenediamine, 350 lb bbls lb.	1.25	1.30	1.25	1.30	1.25	1.30
Toluenesulfonamide, 175 lb. bbls lb.	...	.70	...	.70	...	.70
tks, wks lb.	...	.31	...	.31	...	.31
Toluenesulfonchloride, 410 lb bbls, wks lb.	.20	.22	.20	.22	.20	.22
Toluidine, 350 lb bbls, wks lb.	...	.48	...	.48	...	.48

(*FP*) Full Priority. (*PC*) Price Ceiling. (A) Allocation.

	Current Market		1942 Low	1942 High	1941 Low	1941 High
Paris Green, dealers, drs lb.	.24	.26	.24	.26	.23	.25
Pentane, normal, 28-38° C, group, 3 tks (*PC*) gal.	...	.06½	.06½	.08½	...	.08½
drs, group 3 gal.	...	.11	.11½	.16	.11½	.16
Perchlorethylene, 10 lb drs, frt all'd (*FP*) lb.	.08	.08½	.08	.08½	.08	.08½
Petrolatum, dark amber, bbls lb.	...	.03¾	...	.03¾	.02¾	.03½
White, lily, bbls lb.	...	.05¾	...	.05¾	.04¾	.05¾
White, snow, bbls lb.	...	.06½	...	.06½	.05½	.06½
Petroleum Ether, 30-60°, group 3, tks gal.	...	.16	...	.16	.13½	.16
drs, group 3 gal.	...	.18	...	.18	.14½	.18

PETROLEUM SOLVENTS AND DILUENTS

Cleaners naphthas, group 3, tks, wks gal.	...	.07⅛	...	.07⅛	.07	.07⅛
East Coast, tks, wks gal.	...	.11	.10½	.11	.10	.10½
Lacquer diluents, tks East Coast gal.	...	.11	...	.11	.09½	.11
Group 3, tks gal.	.07⅜	.07½	.07⅜	.08⅛	.06¼	.08⅛
Naphtha, V.M.P., East tks, wks gal.	...	.11	.10½	.11	.09	.11
Group 3, tks, wks gal.	...	.07⅛	...	.07⅛	.06	.07⅛
Petroleum thinner, 43-47, East, tks, wks gal.	.08¾	.09½	.08¾	.09½	.08¾	.09½
Group 3, tks, wks gal.	.06	.07	.06	.07	.05⅞	.07
Rubber Solvents, stand grd, East, tks, wks gal.	...	.11	.10½	.11	.09½	.10½
Group 3, tks, wks gal.	...	.07⅛	...	.07⅛	.06	.07⅛
Stoddard Solvents, East, tks, wks gal.	...	.09½	...	.09½	.083	.09½
Group 3, wks gal.	...	.06⅝	...	.06⅝	.05½	.06⅝
Phenol, 250-100 lb drs lb.	...	.12½	.12½	.13	.12	.13¾
tks, wks (*FP*) (A) lb.	...	.11½	.11½	.12	.11	.12
Phenyl-Alpha-Naphthylamine, 100 lb kgs lb.	...	1.35	...	1.35	...	1.35
Phenyl Chloride, drs lb.	...	.17	...	.17	...	.17
Phenylhydrazine Hydrochloride, com lb.	...	1.75	...	1.75	...	1.50
Phloroglucinol, tech, tins lb.	15.00	16.50	15.00	16.50	15.00	16.50
CP, tons lb.	20.00	22.00	20.00	22.00	20.00	22.00
Phosphate Rock, f.o.b. mines 70% basis ton	...	2.70	2.40	2.70	2.15	2.40
72% basis ton	...	3.20	3.00	3.20	2.50	3.00
Florida Pebble, 68% basis ton	...	2.20	2.00	2.20	1.90	2.00
75-74% basis ton	...	4.00		4.00	...	2.90
Tennessee, 72% basis ton	...	5.50	5.00	5.50	4.50	5.00
Phosphorus Oxychloride 175 lb. cyl (*FP*) lb.	.15	.18	.15	.18	.15	.18
Red, 110 lb cases lb.	.40	.44	.40	.44	.40	.44
Sesquisulfide, 100 lb cs lb.	.38	.42	.38	.42	.38	.42
Trichloride, cyl lb.	.15	.16	.15	.16	.15	.16
Yellow, 110 lb cs, wks lb.	.18	.20	.18	.20	.18	.20
Phthalic Anhydride, 100 lb drs, wks (A) lb.	.14½	.15½	.14½	.15½	.14½	.15½
Pine Oil, 55 gal drs or bbls Destructive dist lb.	.72	.74	.72	.74	.50	.65
Steam dist wat wh bbls gal.	1.00	nom.	1.00	1.10	.59	.68
Pitch Hardwood, wks ton	23.75	24.00	23.75	24.00	23.75	24.00
Coaltar, bbls, wks ton	19.00	22.00	19.00	22.00	19.00	22.00
Burgundy, dom, bbls, wks lb.	.06	.06½	.06	.06½	.06	.06½
Imported lb.	no prices		no prices		no prices	
Petroleum, see Asphaltum in Gums' Section.						
Pine, bbls bbl.	6.75	7.00	6.75	7.00	6.00	7.00
Polyamylnaphthalene, l-c-l, drs, f.o.b. wks lb.	...	.25	...	.25	.25	.30
Potash, Caustic, wks, sol lb	.06¼	.06¼	.06¼	.06¼	.06¼	.06¼
flake lb.	...	.07	...	.07	...	.07
liquid, tks lb.	...	.02⅞	...	.02⅞	...	.02⅞
Manure Salts, Dom 30% basis, blk unit	...	.60	...	.60	...	.60

POTASSIUM

Potassium Abietate, bbls lb.	...	.08	...	.08	...	.08
Acetate, tech, bbls, delv lb.	...	.28	...	.28	.26	.28
Bicarbonate, USP, 320 lb bbls lb.	.19	.21	.14	.21	.14	.17
Bichromate Crystals, 725 lb cks *(*FP*) lb.	...	.09¾	...	.09¾	.08¾	.09¾
Binoxalate, 30 lb bbls lb.	...	.23	...	.23	...	.23
Bisulfate, 100 lb kgs lb.	.15½	.18	.15½	.18	.15½	.18
Carbonate, 80-85% calc 800 lb cks lb.	.06½	.06¾	.06½	.06¾	.06½	.06¾
liquid, tks lb.	...	.0275	...	.0275	...	.0275
drs, wks lb.	.03	.03¼	.03	.03¼	.03	.03¼
Chlorate crys, 112 lb kgs, wks (*FP*) (A) lb.	nom.	.11	nom.	.11	...	.11
gran, kgs lb.	.12	.14½	.12	.14½	.12	.14½
powd, kgs lb.	.09¾	.10	.09¾	.10	.09½	.10
Chloride, crys, bbls lb.	.08	nom.	.08	nom.	.04	.08
Chromate, kgs (*FP*) lb.	.24	.27	.24	.27	.24	.27
Cyanide, drs lb.	...	.55	...	.55	...	.55
Iodide, 250 lb bbls lb.	1.44	1.48	1.44	1.48	1.35	1.38
Metabisulfite, 300 lb bbls lb.	.18	.20	.18	.20	.18	.21
Muriate, bgs, dom, blk unit	.56	.58	.56	.58	.53½	.58
Oxalate, bbls lb.	.28	.30	.28	.30	.25	.30
Perchlorate, kgs, wks (FP) (A) lb.	.09½	.11	.09½	.11	.09½	.11

* Spot price is ½c higher.

(*FP*) Full Priority. (*PC*) Price Ceiling. (A) Allocation.

Potassium Permanganate
Schaeffer's Salt

Prices

		Current Market		1942 Low	1942 High	1941 Low	1941 High
Potassium (continued):							
Permanganate, USP, crys, 500 & 1000 lb drs, wks (*FP*)	lb.	.19¾	.20¼	.19¾	.21	.19¼	.21
Prussiate, red, bbls	lb.	.70	.75	.70	.75	no prices	
Yellow, bbls	lb.	.17	.19	.17	.19	.16	.19
Sulfate, 90% basis, bgs	ton	...	36.25	...	36.25	...	36.25
Titanium Oxalate, 200 lb bbls	lb.	...	.45	...	.45	...	.40
Pot & Mag Sulfate, 48% basis bgs	ton	...	26.00	...	26.00	26.00	27.00
Propane, group 3, tks (*PC*)	lb.	.02¼	.03¼	.02¼	.03¼	.03¼	.04
Putty, com'l, tubs	100 lb.	...	3.15	...	3.15	...	3.15
Linseed Oil, kgs	100 lb.	...	5.00	...	5.00	...	5.00
Pyrethrum, conc liq: (A) 2.4% pyrethrins, drs, frt all'd	gal.	...	5.75	4.30	5.75	4.40	4.95
3.6% pyrethrins, drs, frt all'd	gal.	...	8.53	6.35	8.53	6.60	7.20
Flowers, coarse, bgs	lb.	.27	.28	.21	.28	.20	.25
bgs	lb.	...	.23	.22	.29	.21	.26
Fine powd, bbls	lb.	...	1.71	...	1.71	...	1.71
Pyridine, denat, 50 gal drs	gal.	...	.46	...	.46	...	.48
Refined, drs	lb.	...					
Pyrites, Spanish cif Atlantic ports, blk	unit	no prices		no prices		no prices	
Pyrocatechin, CP, drs, tins	lb.	2.15	2.40	2.15	2.40	2.15	2.40
Q							
Quebracho, 35% liq tks	lb.	...	.05¼	...	.05¼	.03¾	.05½
450 lb bbls, c-l	lb.	...	.05	...	.05	.04¼	.05
Solid, 63%, 100 lb bales cif	lb.	...	.04⅞	...	.04⅞	...	.04⅞
Clarified, 64% bales	lb.	...	.05	...	.05	.05	.05⅛
Quercitron, 41 deg liq, 450 lb. bbls	lb.	...	.10	...	.10	.08½	.09½
Solid, drs	lb.	...	.18½	.18	.18½	.11	.16½
R							
R Salt, 250 lb bbls, wks	lb.	...	.55	...	.55	...	.55
Resorcinol, tech cans	lb.	.68	.74	.68	.74	.68	.74
Rochelle Salt, cryst	lb.	...	.43½	...	.43½	.32½	.43½
Powd, bbls	lb.	...	.42½	...	.42½	.31½	.42½
Rosin Oil, bbls, first run	gal.	...	.51	.48	.51	.40	.50
Second run	gal.	...	.53	.50	.53	.42	.56
Third run, drs	gal.	...	.57	.54	.57	.46	.57
Rosins 600 lb bbls, 100 lb unit ex, yard NY:**							
B		...	3.90	2.96	3.90	2.06	3.55
D		...	4.00	2.73	4.00	2.08	3.55
E		...	4.09	3.06	4.09	2.07	3.62
F		...	4.13	3.27	4.13	2.08	3.59
G		...	4.13	3.52	4.13	2.18	3.52
H		...	4.13	3.53	4.13	2.27	3.50
I		...	4.13	3.53	4.13	2.26	3.50
K		...	4.14	3.56	4.14	2.36	3.61
M		...	4.15	3.66	4.15	2.38	3.68
N		...	4.15	3.67	4.15	2.47	3.71
WG		...	4.18	3.69	4.81	2.79	4.52
WW		...	4.25	3.73	5.20	3.05	4.57
X		...	4.25	3.73	5.20	3.10	4.57
Rosins, Gum, Savannah (280 lb. unit):**							
B		...	3.15	2.08	3.15	1.31	3.00
D		...	3.35	2.31	3.35	1.51	3.00
E		...	3.42	2.41	3.42	1.60	3.07
F		...	3.46	2.62	3.46	1.62	3.04
G		...	3.46	2.87	3.46	1.60	2.97
H		...	3.46	2.88	3.46	1.63	2.97
I		...	3.46	2.88	3.46	...	2.98
K		...	3.47	2.91	3.47	1.84	3.06
M		...	3.48	3.05	3.48	2.01	3.13
N		...	3.49	3.05	3.50	2.65	3.16
WG		...	3.53	3.06	4.26	2.76	3.97
WW		...	3.58	3.10	4.65	2.96	4.02
X		...	3.58	3.10	4.65	2.96	4.02
Rosin, Wood, c-l, FF grade, NY		1.70	2.00	1.70	2.00	1.40	2.00
Rotten Stone, bgs mines	ton	25.00	37.50	25.50	37.50	25.50	37.50
Imported, lump, bbls	lb.	no prices		no prices		no prices	
Powdered, bbls	lb.	no prices		no prices		no prices	
S							
Sago Flour, 150 lb bgs	lb.	.05	.05¼	.04¾	.05¼	.03½	.05½
Sal Soda, bbls wks	100 lb.	...	1.20	...	1.20	...	1.20
Salt Cake, 94-96%, c-l, bulk wks	ton	...	15.00	...	15.00	13.00	17.00
Chrome, c-l, wks	ton	...	16.00	...	16.00	...	16.00
Saltpetre, gran, 450-500 lb bbls	lb.	...	.082	...	.082	.076	.082
Cryst, bbls	lb.	...	.092	...	.092	.086	.092
Powd, bbls	lb.	...	.092	...	.092	.086	.092
Satin, White, pulp, 550 lb bbls	lb.	.01¼	.01½	.01¼	.01½	.01¼	.01½
Schaeffer's Salt, kgs	lb.	...	.46	...	.46	...	.46

** Jan. 30, 1941, high and low based on 280 lb. unit. Sept. 30 prices.
r Bone dry prices at Chicago 1c higher; Boston ½c; Pacific Coast 2c; Philadelphia deliveries f.o.b. N. Y., refined 6c higher in each case; (*FP*) Full Priority. (*PC*) Price Ceiling. (A) Allocation

Current

Shellac
Sodium Sulfite

	Current Market	1942 Low	1942 High	1941 Low	1941 High
Shellac, Bone dry, bbls ..lb. ‡	.39	.40	.39	.40	.26	.40‡
Garnet, bgs .....lb.	.37	.39	.37	.39	.20	.39
Superfine, bgs .....lb. ‡	.32	.33	.32	.34	.16½	.34
T. N., bgs .....lb. ‡	.31	.32	.31	.33	.16	.33
Silver Nitrate, vials .....oz.	no prices		....	.26⅞	.24	.26⅞
Slate Flour, bgs, wks ....ton	11.00	12.00	9.00	12.00	9.00	10.00
Soda Ash, 58% dense, bgs, c-l, wks .....100 lb.	....	1.15	....	1.15	....	1.15
58% light, bgs ....100 lb.	1.05	1.13	1.05	1.13	1.05	1.08
blk .....100 lb.	....	.90	....	.90	....	.90
paper bgs .....100 lb.	1.05	1.08	1.05	1.08	1.05	1.08
bbls .....100 lb.	...	1.35	...	1.35	1.35	1.45
Caustic, 76% grnd & flake, drs .....100 lb.	...	2.70	...	2.70	...	2.70
76% solid, drs .....100 lb.	...	2.30	...	2.30	...	2.30
Liquid sellers, tks ..100 lb.	...	2.00	...	2.00	...	2.00
SODIUM						
Sodium Abietate, drs .....lb.	...	.11	...	.11	...	.11
Acetate, 60% tech, gran. powd, flake, 450 lb bbls wks .....lb.	....	.05	....	.05	.04	.06
90%, bbls 275 lb delv lb.	.06½	.07	.06½	.07	.06	.07
anhyd, drs, delv .....lb.	.08½	.10	.08½	.10	.08¼	.10
Alginate, drs .....lb.	....	.79	.69	.79	.39	.73
Antimoniate, bbls .....lb.	.15	.15½	.15	.15½	.14	.15½
Arsenate, drs .....lb.	...	.08	...	.08	.07	.08¼
Arsenite, liq, drs .....gal.	...	.35	...	.35	...	.35
Dry, gray, drs, wks ..lb.	...	.08½	.06¾	.08½	.06½	.09¼
Benzoate, USP kgs ....lb.	.46	.50	.46	.50	.46	.50
Bicarb, powd, 400 lb bbl, wks .....100 lb.	...	1.85	1.70	1.85	...	1.70
Bichromate, 500 lb cks, wks (*FP*) .....lb.	...	.07¾	...	.07¾	.06¾	.07½
Bisulfite, 500 lb bbls, wks lb.	.03	.031	.03	.031	.03	.031
35-40% sol bbls, wks 100 lb.	1.35	1.80	1.35	1.80	1.40	1.80
Chlorate, bgs, wks (A) lb.	...	.06¼	...	.06¼	...	.06¼
Cyanide, 96-98%, 100 & 250 lb drs, wks .....lb.	.14	.15	.14	.15	.14	.15
Diacetate, 33-35% acid, bbls, lcl, delv .....lb.	.09½	.10½	.09½	.10½	.09	.10
Fluoride, white 90%, 300 lb bbls, wks .....lb.	...	.08	...	.08	.07	.08
Hydrosulfite, 200 lb bbls, f.o.b. wks .....lb.	.17	.18	.17	.18	.17	.18
Hyposulfite, tech, pea crys 375 lb bbls, wks ..100 lb.	2.75	3.00	2.75	3.00	...	2.80
Tech, reg cryst, 375 lb bbls, wks .....100 lb.	...	2.45	...	2.45	...	2.45
Iodide, Jars .....lb.	...	2.42	...	2.42	...	2.42
Metanilate, 150 lb bbls ..lb.	...	.40	...	.40	.41	nom.
Metasilicate, gran, c-l, wks .....100 lb.	...	2.50	...	2.50	2.35	2.50
cryst, drs, c-l, wks 100 lb.	...	3.05	...	3.05	...	3.05
Anhydrous, wks, c-l, drs .....100 lb.	...	4.00	...	4.00	3.75	4.00
wks, lcl, drs ...100 lb.	...	5.05	...	5.05	5.05	5.05
Monohydrated, bbls ....lb.	...	.03	.026	.03	.023	.026
Naphthenate, drs .....lb.	.12	.19	.12	.19	.12	.19
Naphthionate, 300 lb bbl lb.	...	.50	...	.50	...	.50
Nitrate, 92% crude, 200 lb. bgs. c-l, NY (A) ...ton	...	29.35	...	29.35	28.70	29.35
100 bgs, same basis ..ton	...	30.05	...	30.05	29.40	30.05
Bulk .....ton	...	27.00	...	27.00	...	27.00
Nitrite, 500 lb bbls ....lb.	...	.06¾	...	.06¾	.06¾	.11½
Orthochlorotoluene, sulfonate, 175 lb bbls, wks lb.	.25	.27	.25	.27	.25	.27
Orthosilicate, 300 lb drs, c-l anhyd. .....lb.	...	.04½	.04½	.04¾	.04½	.04¾
hyd, flake, 300 lb bbls, cl, f.o.b. wks .....lb.	...	.0315	.03	.0315	.0285	.03
Perborate, drs, 400 lb ..lb.	...	.14¾	...	.14¾	.14¾	.15¼
Peroxide, bbls, 400 lb ..lb.	...	.17	...	.17	...	.17
Phosphate, di-sodium, tech, 310 lb bbls, wks 100 lb.	2.75	2.90	2.75	2.90	2.30	2.90
bgs, wks .....100 lb.	2.55	2.70	2.55	2.70	2.10	2.70
Tri-sodium, tech, 325 lb. bbls, wks .....100 lb.	...	2.90	2.90	3.05	2.45	3.05
bgs, wks .....100 lb.	...	2.70	2.70	2.85	2.25	2.85
Picramate, 160 lb kgs ..lb.	...	.65	...	.65	...	.65
Prussiate, Yellow, 350 lb bbls, wks .....lb.	...	.11	...	.11	.10½	.11
Pyrophosphate, anhyd, 100 lb bbls f.o.b. wks frt eq lb.	.0528	.0610	.0528	.06	.0510	.0610
Sesquisilicate, drs, c-l, wks .....100 lb.	...	3.05	...	3.05	...	3.05
Silicate, 60°, 55 gal drs, wks .....100 lb.	...	1.70	...	1.70	...	1.70
40°, 55 gal drs, wks 100 lb.	...	.80	...	.80	...	.80
tks, wks .....100 lb.	...	.65	...	.65	...	.65
Silicofluoride, 450 lb bbls NY .....lb.	.09	.14½	.09	.15	.09¾	.15
Stannate, 100 lb drs ....lb.	.33½	.36½	.33½	.36½	.32½	.37
Stearate, bbls .....lb.	.19	.24	.19	.24	.19	.24
Sulfanilate, 400 lb bbls lb.	.16	.18	.16	.18	.16	.18
Sulfate, Anhyd, 550 lb bgs c-l, wks .....100 lb. ‡	1.70	1.90	1.70	1.90	1.45	1.90
Sulfide, 80% cryst, 440 lb. bbls, c-l, wks .....lb.	...	.024	...	.024	.02¼	.03
Solid, 650 lb drs, c-l, wks .....lb.	...	.0315	...	.0315	.03	.03¼
Sulfite, powd, 400 lb bbls wks .....lb.	...	.05¼	...	.05¼	...	.05¼

‡ T. N. and Superfine prices quoted f.o.b. N. Y. and Boston; Chicago prices 1c higher; Pacific Coast 3c; Philadelphia f.o.b. N. Y. ‡ Bags 15c lower; (*PC*) Price Ceiling. (A) Allocation. ‡ Add 3½c per lb to cover marine and war risk insurance.

	Current Market		1942 Low	1942 High	1941 Low	1941 High
Sodium (continued)						
Sulfocyanide, drs ..... lb.	.55	.65	.55	.65	.28	.65
Sulforicinoleate, bbls .... lb.	...	.12	...	.12	...	.12
Supersilicate (see sodium sesquisilicate)						
Tungstate, tech, crys, kgs (A) ..... lb.	no prices		no prices		no prices	
Sorbitol, drs, wks ..... lb.	...	.17¼	...	.17¼	.14¼	.17¼
Spruce, Extract, ord, tks .. lb.	...	.01½	.01¼	.01½	.01⅜	.01¼
Ordinary, bbls .... lb.	...	.02¼	.01¼	.02¼	.01⅜	.01¼
Super spruce ext, tks .. lb.	...	.01½	...	.01½	.01⅜	.01½
Super spruce ext, bbls .. lb.	...	.02	...	.02	.01⅞	.02
Super spruce ext, powd, bgs ..... lb.	...	.04½	.04	.04½	...	.04
Starch, Pearl, 140 lb bgs 100 lb.	...	3.10	...	3.10	2.90	3.10
Powd, 140 lb bgs ..100 lb.	...	3.20	...	3.20	3.05	3.80
Potato, 200 lb bgs ..... lb.	...	.0637	.061	.0637	.04½	.0585
Imp, bgs ..... lb.	no prices		no prices		no prices	
Rice, 200 lb bbls ..... lb.	.09	.10	.09	.10	.07½	.09½
Sweet Potato, 240 lb bbls, f.o.b. plant .....100 lb.	nom.	7.00	nom.	7.00	nom.	7.00
Wheat, thick, bgs ..... lb.	...	.05	...	.05	...	.05
Strontium, carbonate, 600 lb bbls, wks ..... lb.	no prices		no prices		no prices	
Nitrate, 600 lb bbls, NY lb.	.07¾	.08¾	.07¾	.08¾	.07¾	.08¾
Sucrose, octa-acetate, den, grd, bbls, wks ..... lb.	...	.45	...	.45	...	.45
tech, bbls, wks ..... lb.	...	.40	...	.40	...	.40
SULFUR						
Sulfur, crude, f.o.b. mines ton	...	16.00	...	16.00	...	16.00
Flour, com'l, bgs ...10u lb.	1.65	1.95	1.65	1.95	1.40	1.95
bbls .....100 lb.	1.95	2.50	1.95	2.50	1.95	2.50
Rubbermakers, bgs .100 lb.	...	2.05	...	2.05	...	2.05
bbls .....100 lb.	...	2.35	...	2.35	...	2.35
Extra fine, bgs ....100 lb.	...	2.35	...	2.35	...	2.35
Superfine, bgs .....100 lb.	2.65	2.80	2.65	2.80	2.65	2.80
bbls .....100 lb.	2.25	3.10	2.25	3.10	2.25	3.10
Flowers, bgs .....100 lb.	3.05	3.35	3.05	3.35	2.80	3.35
bbls .....100 lb.	3.40	3.70	3.40	3.70	3.15	3.70
Roll, bgs .....100 lb.	2.40	2.70	2.40	2.70	2.15	2.70
bbls .....100 lb.	2.30	2.85	2.30	2.85	2.30	2.85
Sulfur Chloride, 700 lb drs, wks ..... lb.	.03	.08	.03	.08	.03	.08
Sulfur Dioxide, 150 lb cyl lb.	.07	.08	.07	.09	.07	.09
Multiple units, wks .... lb.	.04½	.06	.04½	.07	.04½	.07
tks, wks ..... lb.	.04	.06	.04	.06	.04	.06
Refrigeration, cyl, wks .lb.	.13	.21	.13	.40	.16	.40
Multiple units, wks .... lb.	...	.06½	.06½	.10	.07½	.10
Sulfuryl Chloride ..... lb.	.15	.40	.15	.40	.15	.40
Sumac, Italian, grd .....ton	no prices		no prices		no prices	
Extract, 42°, bbls ..... lb.	...	.08	.06¼	.08	.06	.08
Superphosphate, 16% bulk, wks ..... ton	10.10	10.74	10.10	10.80	8.50	10.00
Run of pile ..... ton	9.60	10.24	9.60	10.24	8.00	9.60
Triple, 40-48%, a.p.a. bulk, wks, Balt. unit .....ton	...	.85	.80	.85	.68	.80
T						
Talc, Crude, 100 lb bgs, NY ton	12.50	24.50	12.50	24.50	14.00	16.00
Ref'd 100 lb bgs, NY ton	17.25	19.25	17.25	19.25	17.25	19.25
French, 220 lb bgs, NY ton	no prices		no prices		no prices	
Ref'd, white bgs, NY ton	no prices		no prices		no prices	
Italian, 220 lb bgs to arr ton	no prices		no prices		no prices	
Ref'd, white bgs, NY ton	no prices		no prices		no prices	
Tankage, Grd, NY ....unit s	...	4.60	4.25	4.85	2.35	4.10
Ungrd .....unit s	...	4.96	5.25	5.70	2.35	5.10
Fert grade, f.o.b. Chgo unit s	...	5.37	5.60	5.90	2.35	5.60
South American cif unit s	...	nom.	5.05	5.60	2.60	4.75
Tapioca Flour, high grade, bgs ..... lb.	.04¼	.07½	.04	.07½	.03	.06¾
Tar Acid Oil, 15%, drs .gal.	...	.27½	...	.27½	.22	.24
25% drs (A) ..... gal.	...	.31½	...	.31½	.25	.27½
Tar, pine, delv, drs ....gal.	...	.33	.32½	.33	.26	.29
tks, delv, E. cities ....gal.	...	.24½	.24	.24½	...	.22
Tartar Emetic, tech, bbls .lb.	...	.47¾	...	.47¾	.36¾	.47¾
USP, bbls ..... lb.	.52¾	.53	.52¾	.53	.42	.53
Terpineol, den grade, drs lb.	...	.17	...	.17	...	.17
Tetrachlorethane, 650 lb drs lb.	.08	.08½	.08	.08½	.08	.08½
Tetrachlorethylene, drs, tech lb.	.08	.09	.08	.09	.08	.09
Tetralene, 50 gal drs, wks lb.	...	.19	...	.19	.19	.21
Thiocarbanilid, 170 lb bbls lb.	...	.24	...	.24	...	.24
Tin, crystals 500 lb bbls, wks lb	.39	.39½	.39	.39½	.38	.40
Metal, NY (*PC*) (A) .lb.	...	.52	...	.52	.501	.52¾
Oxide, bbls, wks ..... lb.	...	.55	.55	.57	.54	.56
Tetrachloride, 100 lb drs, wks ..... lb.	no prices		no prices		.25¼	.31
Titanium Dioxide, 300 lb bbls (*PC*) ..... lb.	...	.14½	...	.14½	.13¼	.14½
Barium Pigment, bbls .lb.	.05¾	.06½	.05¾	.06½	.05¾	.06½
Calcium Pigment, bbls .lb.	.05½	.05¾	.05½	.05¾	.05½	.05¾
Titanium tetrachloride, drs, f.o.b. Niagara Falls ....lb.	.32	.45	.32	.45	.32	.45
Titanium trichloride 23% sol, bbls f.o.b. Niagara Falls lb.	.22	.26	.22	.26	.22	.26
20% solution, bbls .....lb.	.175	.215	.175	.215	.175	.215
Toluidine, mixed, 900 lb drs, wks ..... lb.	...	.26	...	.26	...	.26
Toluol, drs, wks (*FP*) (A) ..... gal.	...	.33	...	.33	.32	.33
tks, frt all'd (*FP*) ....gal.	...	.28	...	.28	.27	.28
Toner Lithol, red, bbls ...lb.	.55	.60	.55	.60	.55	.60
Para, red, bbls ..... lb.	.70	.75	.70	.75	.70	.75
Toluidine, bgs ..... lb.	...	1.05	...	1.05	...	1.05
Triacetin, 50 gal drs, wks, lb.	...	.26	...	.26	...	.26
Triamyl Borate, lcl, drs, wks, lb.	...	.33	...	.33	.27	.33
Triamylamine, drs, lcl, wks, drs ..... lb.	...	1.01	...	1.01	...	1.01

(*FP*) Full Priority. (A) Allocation

	Current Market	1942 Low	1942 High	1941 Low	1941 High
Tributylamine, lcl, drs, f.o.b. wks lb.	...	.81	.81	...	.81
Tributyl citrate, drs, frt all'd lb.	...	.34	.24	.34	.24	.26
Tributyl Phosphate, frt all'd lb.	...	.47	...	.47	.42	.47
Trichlorethylene, 600 lb drs, frt all'd E. Rocky Mts lb.	(*FP*) .08	...	.08	.08	.09
Tricresyl phosphate, tech, (*FP*) drms cl dlvd lb.	.25	.31	.25	.31	.22	.36½
Triethanolamine, 50 gal drs, wks lb.	...	.19	...	.19	...	.19
tks, wks lb.	...	.18	...	.18	...	.18
Triethylamine, lcl, drs, f.o.b. wks lb.	...	1.16	...	1.16	...	1.16
Triethylene glycol, drs, wks lb.	...	.26	...	.26	...	.26
Trihydroxyethylamine Oleate, bbls lb.	...	.30	...	.30	...	.30
Stearate bbls lb.	...	.30	...	.30	...	.30
Trimethyl Phosphate, drs, lcl, f.o.b. dest. lb.	.54	.56	.54	.56	.50	.54
Trimethylamine, c-l, drs, frt all'd E. Mississippi ... lb.	...	.85	...	.85	.85	1.00
Triphenylguanidine ..... lb.	.58	.60	.58	.60	.58	.60
Triphenyl Phosphate, drs (*FP*) lb.	.31	.32	.31	.32	.33	.38
Tripoli, airfloated, bgs, wks ton	...	21.50	21.00	26.00	21.00	26.00
Turpentine (Spirits), c-l, NY dock, bbls gal.	...	.78	.69¼	.82½	.45	.83
Savannah, bbls.* ..... gal.	...	.64½	.55¼	.70½	.33½	.72½
Wood Steam dist, drs, c-lcl, NY gal.	...	.64	.61	.80	.35	.76
tks, delv E. cities . gal.	...	.59	.56	.72	...	...
Wood, dest dist, cl-lcl, drs, delv E. cities ..... gal.	.55	.58	.55	.70	.35	.65
tks, delv E. cities .. gal.	...	.50	.50	.58	...	...
U						
Urea, pure 112 lb cases .. lb.	...	.12	...	.12	...	.12
Fert grade, bgs, c. i. f. S.A. points ..... ton	no prices		no prices		no prices	
Dom f.o.b., wks ..... ton	...	80.00	...	80.00	...	85.00
Urea Ammonia, liq., nitrogen basis ..... ton	...	121.58	...	121.58	...	121.58
V						
Valonia beard, 42%, tannin bgs ..... ton	no prices		no prices		no prices	
Cups, 32% tannin bgs .. ton	no prices		no prices		no prices	
Extract, powd, 63% ... lb.	no prices		no prices		no prices	
Vanillin, ex eugenol, 25 lb tins, 2000 lb lots .... lb.	...	2.00	2.00	2.60	...	2.60
Ex-guaiacol ..... lb.	...	2.35	...	2.35	2.50	2.55
Ex-lignin ..... lb.	...	2.35	...	2.35	2.50	2.55
Vermilion, English, kgs .. lb.	3.12	3.17	3.12	3.17	3.12	3.17
W						
Wattle Bark, bgs ..... ton	41.00	43.00	41.00	43.00	37.50	43.00
Extract, 60°, tks, bbls .. lb.	.04475	.046	.04475	.0475	.03¾	.05
Wax, Bayberry, bgs ..... lb.	.18	.20	.18	.20	.18	.20
Bees, bleached, white 500 lb slabs, cases ..... lb.	...	.61	.58	.61	.36½	.56
Yellow, African, bgs .. lb.	...	.49	...	.49	.30	.47
Brazilian, bgs ..... lb.	...	.50	...	.50	.31	.50
Refined, 500 lb slabs, cases lb.	.59	.60	.55	.60	.33	.52
Candelilla, bgs ..... lb.	...	.38	.33	.38	.19	.33
Carnauba, No. 1, yellow, bgs ..... lb.	.88	.89	.87	.89	.68	.88
No. 2, yellow, bgs ... lb.	.87	.88	.86	.88	.66	.85
No. 2, N. C., bgs .... lb.	.84	.85	.82	.85	.62	.79
No. 3, Chalky, bgs ... lb.	.77	.78	.75	.78	.55	.78
No. 3, N. C., bgs .... lb.	.78	.79	.77	.79	.58	.79
Ceresin, dom, bgs ..... lb.	.13½	.14	.13½	.14	.11	.14
Japan, 224 lb cases .... lb.	.40	.45	.30	.45	.16½	.35
Montan, crude, bgs .... lb.	.45	.46	.45	.46	.45	.46
Paraffin, see Paraffin Wax.						
Spermaceti, blocks, cases lb.	.26	.27	.24	.27	.24	.25
Cakes, cases ..... lb.	.27	.28	.25	.28	.25	.26
Wood Flour, c-l, bgs .... ton bgs, c-l, wks ..... ton	24.00	25.00	24.00	25.00	24.00	25.00
Whiting, chalk, com 200 lb	18.00	22.00	18.00	22.00	18.00	19.00
Gilders, bgs, c-l, wks .. ton	20.00	24.00	16.00	24.00	16.00	20.00
X						
Xylol, frt all'd, East 10° tks, wks ..... gal.	...	.27	...	.27	...	.29
Com'l tks, wks, frt all'd gal.	...	.27	...	.27	.26	.27
Xylidine, mixed crude, drs lb.	.35	.36	.35	.36	.35	.36
Z						
Zein, bgs, 1000 lb lots, wks ..... lb.	...	.20	...	.20	...	.20
Zinc Acetate, tech, bbls, lcl, delv ..... lb.	.16	.17	.16	.17	.15	.16
Arsenite, bgs, frt all'd .. lb.	...	.12	...	.12	...	.12
Carbonate tech, bbls, NY lb.	.14	.20	.14	.20	.14	.20
Chloride fused, 600 lb drs, wks ..... lb.	...	.05	...	.05	...	.05
Gran, 500 lb drs, wks lb.	...	.0575	...	.0575	...	.0575
Soln 50%, tks, wks 100 lb.	...	2.50	...	2.50	2.25	2.50

(*FP*) Full priority. (*PC*) Price Ceiling. Sept. 30 price.

Zinc Cyanide
Whale Oil

Prices Current

	Current Market		1942 Low	1942 High	1941 Low	1941 High
Zinc (continued)						
Cyanide, 100 lb drs	lb.	.33	.37	.33	.37	.33	.37
Dust, 500 lb bbls, c-l, delv	lb.	...	.1035	...	.1035	.09¼	.1035
Metal, high grade slabs, c-l,							
NY (*FP*) (*PC*) 1000 lb.		...	8.65	...	8.65	7.65	8.64
E. St. Louis 100 lb.		...	8.25	...	8.25	7.25	8.25
Oxide, Amer, bgs, wks	lb.	...	.07¼	...	.07¼	.06½	.07¼
French 300 lb bbls, wks	lb.	...	.07¼	...	.07¼	.06¾	.07¼
Palmitate, bbls	lb.	.32	.33	.32	.33	.24½	.33
Resinate, fused, pale bbls	lb.	.11	.12	.10	.12		.10
Stearate, 50 lb bbls	lb.	.30	.31	.30	.31	.22	.31
Sulfate, crys, 40 lb bbls wks	lb.	...	.360	.360	.365	.315	.365
Flake, bbls	lb.	...	.410	.405	.410	.335	.405
Sulfide, 500 lb bbls, delv	lb.	...	.08½	.08	.08½	...	.08
bgs, delv (*PC*)	lb.	.14	.14¼	.14	.14¼	.08	.13¼
Sulfocarbolate, 100 lb kgs	lb.	.24	.25	.24	.29	.03⅜	.07¾
Zirconium Oxide, crude, 70-75% grd, bbls, wks	ton	75.00	100.00	75.00	100.00	75.00	100.00

Oils and Fats

Babassu, tks, futures	lb.	...	.111	no prices		...	.06
Castor, No. 3, 400 lb drs	lb.	...	.13¾	.12½	.13¾	.0180	.12½
(A) (*PC*) Blown, 400 lb drs	lb.	...	.15¼	.14	.15¼	.11¾	.14
China Wood, drs, spot NY	lb.	...	.39	.39	.40⅛	.27¼	.37¼
Tks, spt NY (*PC*)	lb.	...	.3875	.3875	...	.26¼	.35½
Coconut, edible, drs NY	lb.	...	.0985	...	...	.08	.15½
Manila, tks, NY (*PC*)	lb.	...	.0835	...	...	.03⅜	.10
Tks, Pacific Coast	lb.	no prices		no prices		...	.03¼
Cod, Newfoundland, 50 gal bbls	gal.	...	.90	.85	.90	.07½	.80
Copra, bgs, NY	lb.	no prices		no prices		.0180	.04¼
Corn, crude, tks, mills	lb.	.12¾ nom.		.12½	.12¾	.06½	.13
Refd, 375 lb bbls, NY	lb.	.15½ nom.		.15	.15½	.14¾	.16
Degras, American, 50 gal bbls, NY	lb.	.12½ nom.		.11½	.12½	.07½	.08¾
Greases, Yellow	lb.	...	.0929	...	.0929	.04¾	.08½
White, choice, bbls, NY	lb.	...	.097	...	.097	.05	.09
Lard, Oil, Edible, prime	lb.	...	.16	.15½	.16	.08½	.14½
Extra, bbls	lb.	...	.15¼	.15	.15¼	.08¼	.13¾
Extra, No. 1, bbls	lb.	...	.14¾	.14½	.14¾	.08	.13¼
Linseed, Raw less than 5 drs lots	lb.	...	.145	.125	.149	.091	.123
drs, c-l, spot	lb.	.135	.137	.117	.143	.095	.190
Tks	lb.	.126	.128	.108	.134	.084	.1060
Menhaden, tks, Baltimore	lb.	...	.089	.63¾	.666	.30	.60*
Refined, alkali, drs	lb.	.127	.129	.12	.129	.084	.122
Kettle boiled, drs	lb.	.137	.139	.13	.139	.096	.132
Light pressed, drs	lb.	.137	.139	.11	.139	.082	.112
Tks	lb.	.109	.11	.102	.11	.072	.10
Neatsfoot, CT, 20°, bbls, NY	lb.	nom.	.25¾	...	.25¾	.18¼	.26½
Extra, bbls, NY	lb.	nom.	.14⅞	...	.14⅞	.08¼	.14
Pure, bbls, NY	lb.	nom.	.19¼	.17¾	.19¼	.12¼	.17¾
Oiticica, bbls (*PC*)	lb.	.23	.25	.29	.25	.16½	.23½
Oleo, No. 1, bbls, NY	lb.	...	.13¼	...	.13¼	.07⅜	.13¼
No. 2, bbls, NY	lb.	...	.13	...	.13	.07⅜	.13
Olive, denat, bbls, NY	gal.	3.50	4.00	3.50	4.50	2.25	4.25
Edible, bbls, NY	gal.	4.00	4.25	4.00	5.50	4.75	5.30
Foots, bbls, NY	lb.	.19	nom.	.19	.20	.10¼	.19
Palm, Kernel, bulk	lb.	no prices		no prices		no prices	
Niger, cks	lb.	...	.0825	.0925	...	.04¾	.09
Sumatra, tks	lb.	no prices		no prices		.02	.09
Peanut, tks, f.o.b. mill	lb.	...	.13	.12⅞	.13	.05¼	.16
Refined, bbls, NY	lb.	.17	nom.	.16¾	.17	.08	.16
Perilla, drs, N Y (A)	lb.	...	.246	...	.246	.18	.23
Tks, Coast	lb.	...	.2380	...	.2380	.16½	.21½
Pine, see Pine Oil, Chem. Sec.							
Rapeseed, blown, bbls, NY	lb.	.18	.18½	.18	.18½	.16½	.18
Denatured, drs, NY	gal.	...	nom.	...	nom.	.95	1.00
Red, Distilled, drs	lb.	.11¾	.13½	.11¾	.143	.07¼	.13
Tks	lb.	.11	.11¾	.11	.12½	.06¼	.11½
Sardine, Pac Cst, tks (*PC*)	lb.	.0890		.66½	nom.	.39	.62½*
Refined alkali, drs	lb.	.127	.129	.12	.129	...	...
Light pressed, drs	lb.	.117	.119	.11	.119	.084	.122
Tks	lb.	.109	.11	.102	.11	.078	.112
Soy Bean, crude							
Dom, tks, f.o.b. mills	lb.	.12¼	nom.	.12¼	nom.	.05¾	.12¼
Crude, drs, NY	lb.	.13	...	.13	nom.	.06¼	.12¼
Ref'd, drs, NY	lb.	.14¼	nom.	.14¼	nom.	.05½	.12¼
Tks	lb.	.13½	nom.	.13½	nom.	.07¼	.13½
Sperm, 38° CT, bleached (*FP*) bbls, NY (A)	lb.	.1301	...	.1301	nom.	.11	.127
45° CT, blchd, bbls, NY	lb.	.1278	...	.1278	nom.	.103	.12
Stearic Acid, double presaed dist bgs	lb.	.14	.15¼	.14	.16½	.09½	.13¾
Double pressed saponified bgs	lb.	.15¼	.16¾	.15¼	.16¾	.09¾	.14
Triple pressed dist bgs	lb.	.17	.18¾	.17	.19½	.12½	.16½
Stearine, Oleo, bbls	lb.	...	.11	...	.11	...	.09
Tall, crude, drs, c-l, wks	ton	...	55.00	40.00	55.00	...	...
tks, wks	ton	...	40.00	30.00	40.00	...	...
dist, drs, c-l, delv	lb.	...	.05	.04	.05	...	...
tks, wks	lb.	...	.04½	.03½	.04½	...	...
Tallow City, extra loose	lb.	...	.097¼	...	.097¼	...	.07¾
Edible, tierces	lb.	no prices		no prices		...	.05½
Acidless, tks, NY	lb.	.13	nom.	.13	nom.	.07½	.11½
Turkey Red, single, drs	lb.	...	.08¾	...	.08¾	.06½	.08¾
Double bbls	lb.	...	.12	...	.12	.09½	.11
Whale:							
Winter bleach, bbls, NY	lb.	...	.1110	...	.1110	.099	.1110
Refined, nat, bbls NY	lb.	...	.1070	...	.1070	.095	.1070

(*FP*) Full Priority. (*PC*) Price Ceiling. (A) Allocation

* Previous prices were on gallon basis.

Canadian Review

(*Continued from page 617*)

sible in order to release manpower for the armed services and war needs.

Canada's new "home-grown" magnesium industry is now swinging into production. The first Canadian plant to manufacture magnesium under the Pidgeon Process started operation towards the end of August. By mid-September seven of the ten furnaces were underway with at least three, running full blast. Actual output has been hampered by the fact that the plant will not have dolomite from its own kilns available until mid-October. Meanwhile the plant is operating on purchased dolomite and recoveries are reported as lower than would otherwise be the case.

By mid-October it is expected that the plant will be producing at 70 per cent of capacity and very quickly stepped up to full output after that. Production is under the supervision of Wartime Metals Corporation, a Crown company formed by the dominion government. The actual building and operation is in charge of Dominion Magnesium Co., a private concern operating without fee or profit. Canada's new production will go a considerable way to meeting her own needs and relieving the need for imports.

Canada is also making a contribution in this field by supplying large quantities of sphagnum peat moss from British Columbia for the development at Nevada, of magnesite ore deposits.

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Index to Advertisers

Index to Advertisers

"WE"-EDITORIALLY SPEAKING

A. D. McFadyen, author of "Personalities in Chemistry" suggests that "we" ask the readers of C.I. for "nominations" for this special hall of chemical fame. Let's hear your proposals.

We bow to no man in our unbounded enthusiasm for the future of plastics, except to one, Victor J. Young, a New York pharmacist, who claims that he advanced $19,375 to Irving C. Wimbourne, a salesman, as the purchase price of 17 plastics patents. The New York district attorney's office reports the plastics patents were figments of the fertile imagination of Wimbourne. At least it is a sign that plastics, in the minds of some, have at last reached a stage of maturity along with oil-less oil wells and gold-less gold mines.

Don't forget to see us at the National Chemical Exposition along with "New Chemicals for Industry" completely revamped and brought up-to-date. The place is the Hotel Sherman, Chicago, and the dates—Nov. 24-29. Which reminds us that one of those days is Thanksgiving. There will be a lot of the boys looking for invitations to a home-cooked turkey dinner.

We are delighted to report that Miss H. Garry has joined the staff as editorial assistant. Miss Garry majored in chemistry at Hunter College and has worked in chemical laboratories and plants.

We are also pleased to report that the 1942 Buyer's Guidebook is reaching the final stages of preparation and printing. As ever—it is bigger and better.

Did you know that:

Shellac that would make six phonograph records will waterproof the primer cups of 100,000 rounds of 30-calibre cartridges?

Priorities
Allocations
Price Controls

See the Statistical and Technical Data Section (Part 2 of this issue) for monthly digest of Government Regulations of Materials and Prices. Invaluable to you in your work.

There is a new pocket-size magazine being published out on the coast known as *Frauds and Answer Magazine*. Under the heading "American Paytrioteers—Uncle Sam Paddles His Big Acid Trust" it discloses some brand new chemicals which even the industry has never heard of, such as, for example, cromic (*sic*) acid, bichromic acid. May we respectfully suggest that the editor take a general chemistry book home with him some evening before again dashing off into print on a subject that obviously he is unprepared to discuss intelligently.

The trend of the times is well-illustrated by the new course at Pratt Institute in chemistry laboratory technology planned especially for women in war industries. We are facing the necessity of replacing manpower in the chemical industry with women—not in the laboratories of the country alone, but in many operations in the plant as well. Victor Chemical has been making a very close study of just this problem and we are delighted to report that in one of the future issues of this publication the benefit of this experience is going to be made available to our readers.

The plastics industry is certainly coming into its own under the stress of all-out war. Latest Treasury Department plan is to mint a ½ cent coin made of plastic material.

From "My Day" by Eleanor Roosevelt—"I have been asked to write a column on how the White House would be run on $25,000 a year. Of course, the question is rather foolish, because the White House is not the property of any private individual. It belongs to the people of the United States and those who live in it are there only temporarily."

A lot of people will be relieved to have "official confirmation" of the latter.

Attention Local Draft Boards:—David Anderson, in *The Philadelphia Record*, Sept. 18, '42, reports—"The names of 200 French industrial chemists have been presented to Pierre Laval in answer to his demand for 'volunteers' to fill posts in Germany."

We suppose you saw the headlines a few weeks ago announcing that DuPont had paid a chemist $350,000 for a patent. And what do you suppose that indiviual is doing now? He is a private in the United States Army. To the credit of the army we understand he is engaged in chemical work at $50 a month. Who said this isn't a "People's War."

Fifteen Years Ago

(From Our Files of October, 1927)

Publicker, Inc., Philadelphia, announces opening of a chemical products division.

Du Pont to build $8,000,000 rayon plant near Richmond, Va.

Franco-German dye and fertilizer agreement reached. Foreign markets will be divided to reduce home competition.

Oldbury Electrochemical reported taking over Phosphorous Compounds Co. of Niagara Falls.

Several prominent officials of the German Dye Trust arrive in New York aboard the liner Resolute.

One hundredth birthday of Marcelin Berthelot celebrated at a dinner in New York with Ambassador Claudel and Charles H. Herty as the principal speakers.

State of Chemical Trade

Current Statistics (September 30, 1942)—p. 113

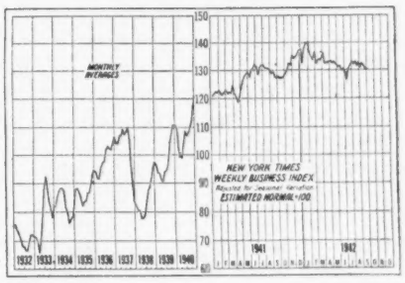
WEEKLY STATISTICS OF BUSINESS

Week Ending	Carloadings 1942	Carloadings 1941	Carloadings % of Change	Electrical Output* 1942	Electrical Output* 1941	Electrical Output* % of Change	Jour. of Com. Price Index	Nat'l Chem. & Drugs	Fertilizer Fats & Oils	Ass'n Fert. Mat.	Price Indices Mixed Fert.	Price Indices All Groups	†Labor Dept. Chem. & Drug Price Index	% Steel Activity	N. Y. Times Index Bus. Act.	Fisher Commodity Index
Sept. 5	887,960	797,791	+11.3	3,672,921	3,132,954	+12.4	103.8	120.7	141.0	117.9	115.3	129.0	96.2	97.6	130.8	107.2
Sept. 12	814,885	914,656	—10.9	3,583,408	3,222,346	+12.4	104.2	120.7	140.2	117.9	115.3	129.2	96.2	96.4	132.1	107.4
Sept. 19	903,099	907,969	— 0.5	3,756,922	3,273,375	+14.8	104.2	120.7	140.9	117.9	115.3	129.3	96.2	97.2	131.2	107.5
Sept. 26	897,714	919,794	— 2.4	3,720,254	3,273,376	+13.7	104.4	120.7	141.2	117.9	115.3	130.0	96.2	96.2	130.2	107.8
Oct. 3	907,607	917,896	— 1.1	3,682,794	3,330,582	+10.6	104.7	120.7	141.8	117.9	115.3	130.2	96.2	97.3	130.1	108.2

MONTHLY STATISTICS

CHEMICAL:	July 1942	July 1941	June 1942	June 1941	May 1942	May 1941
Acid, sulfuric (expressed as 50° Baumé, short tons, Bureau of the Census)						
Total prod. by fert. mfrs.	No Longer Available		.....	.....	.....	.....
Consumpt. in mfr. fert.	.....	.....	.....	.....	.....	.....
Stocks end of month	.....	.....	.....	.....	.....	.....
Alcohol, Industrial (Bureau Internal Revenue)						
Ethyl alcohol prod., proof gal..	No Longer Available		.....	.....	.....	.....
Comp. denat. prod., wine gal...	.....	.....	.....	.....	.....	.....
Removed, wine gal.	.....	.....	.....	.....	.....	.....
Stocks end of mo., wine gal...	.....	.....	.....	.....	.....	.....
Spec. denat. prod., wine gal. ..	.....	.....	.....	.....	.....	.....
Removed, wine gal.	.....	.....	.....	.....	.....	.....
Stocks end of mo., wine gal...	.....	.....	.....	.....	.....	.....
Ammonia sulfate prod., tons *a*..	.....	.....	63,887.9	61,374.3	66,874	61,495
Benzol prod., gal. *b*	No Longer Available		.....	.....	.....	.....
Byproducts coke, prod., tons *a*..	.....	.....	5,117,784	4,841,700	5,275,803	4,845,854
Cellulose Plastic Products (Bureau of the Census)						
Nitrocellulose sheets, prod., lbs.	.....	.....	946,198	913,725	898,034	935,239
Sheets, ship., lbs.	.....	.....	900,336	988,185	842,013	863,997
Rods, prod., lbs.	.....	.....	364,652	332,433	340,205	306,719
Rods, ship., lbs.	.....	.....	342,653	363,191	325,579	346,031
Tubes, prod., lbs.	.....	.....	63,626	140,482	57,457	130,457
Tubes, ship., lbs.	.....	.....	121,162	124,067	137,143	104,711
Cellulose acetate, sheets, rods, tubes						
Production, lbs.	.....	.....	556,579	512,506	465,100	524,393
Shipments, lbs.	.....	.....	523,011	523,438	482,676	472,328
Molding comp., ship.; lbs. ..	.....	.....	3,048,020	2,264,470	3,053,767	2,145,523
Methanol (Bureau of the Census)						
Production, crude, gals.	No Longer Available		.....	.....	.....	.....
Production, synthetic, gals. ...	.....	.....	.....	.....	.....	.....
Pyroxylin-Coated Textiles (Bureau of the Census)						
Light goods, ship., linear yds...	..	.....	3,178,812	4,313,872	3,534,240	4,733,765
Heavy goods, ship., linear yds..	.....	.....	2,829,929	3,164,815	2,859,545	3,172,565
Pyroxylin spreads, lbs. *c*	.....	.....	4,660,719	7,464,431	5,532,021	7,350,684
Exports (Bureau of Foreign & Dom. Commerce)						
Chemicals and related prod. *d*..	Exports and Imports No Longer Available					
Crude sulfur *d*	.....	.....	.....	.....	.....	.....
Coal-tar chemicals *d*	.....	.....	.....	.....	.....	.....
Industrial chemicals *d*	.....	.....	.....	.....	.....	.....
Imports						
Chemicals and related prod. *d*..	.....	.....	.....	.....	.....	.....
Coal-tar chemicals *d*	.....	.....	.....	.....	.....	.....
Industrial chemicals *d*	.....	.....	.....	.....	.....	.....
Employment (U. S. Dept. of Labor, 3 year av., 1923-25=100) Adjusted to 1937 Census Totals						
Chemicals and allied prod., including petroleum	156.7	140.0	156.7	171.1	156.6	135.9
Other than petroleum	.....	.....	..	..	162.7	139.3
Chemicals	195.2	175.9	195.8	172.1	192.1	166.8
Explosives	No Longer Available				.....	.....
Payrolls (U. S. Dept. of Labor, 3 year av., 1923-25=100) Adjusted to 1937 Census Totals						
Chemicals and allied prod., including petroleum	.....	.....	.....	.....	224.2	165.5
Other than petroleum	.....	.....	.....	.....	238.4	171.5
Chemicals	.....	.....	.....	.....	297.7	221.8
Explosives	No Longer Available		.....	.....	.....	.....
Price index chemicals*	96.5	87.3	96.5	87.2	96.5	86.7
Drugs & Pharmaceuticals* ...	129.1	100.0	129.1	99.9	129.1	98.7
Fert. mat.*	82.8	74.0	82.8	69.9	82.8	71.1
Paint and paint mat.	100.7	91.6	100.3	90.3	100.6	89.3
FERTILIZER:						
Exports (long tons, Nat. Fert. Association)						
Fertilizer and fert. materials ..	Exports and Imports No Longer Available					
Total phosphate rock	.....	.....	.....	.....	.....	.....
Total potash fertilizers	.....	.....	.....	.....	.....	.....
Imports (long tons, Nat. Fert. Association)						
Fertilizer and fert. materials ..	.....	.....	.....	.....	.....	.....
Sodium nitrate	.....	.....	.....	.....	.....	.....
Total potash fertilizer	.....	.....	.....	.....		

INDUSTRIAL TRENDS



Business: Industrial and business activity continued to expand under impetus of rising war production during August and September. As a new quarter begins the diverging trends of the country's industries is becoming more evident. Pushed by war demands the heavy industries and producers' durable goods are increasingly supplanting regular business in consumers goods.

During August the Federal Reserve Board's Index of Industrial Production was placed at 183 compared with 180 in July and 161 in August, 1941. The *New York Times* weekly business index fluctuated to some extent during the month of September with a net loss of seven-tenths of a point from 130.8 for week ending September 5th to 130.1 for week ending October 3rd.

Steel: According to a report from the American Iron and Steel Institute, steel production in the third quarter of '42 was the second highest quarterly total in history. The total of 21,449,359 tons produced in the three-month period came within a fraction of a percentage point of the record 21,531,358 tons produced in second quarter of this year. During first nine months, 64,019,606 tons of steel have been produced, 4% above production in similar period of 1941. Output for September, 1942, was 7,067,084 tons, equivalent to 96.5% of capacity.

According to a report by David F. Austin, acting chief, Iron and Steel Branch, W.P.B., more than 75% of steel output is going directly into war use and remainder into such essential industries as railroads, manufacture of machinery, etc. About 80% of steel is being delivered on ratings of A-1-A or higher.

Carloadings: Railroad freight car loadings were sustained at high level during September. Although the number of loadings was down slightly from last year, 0.72%, the amount of freight carried, or

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ton-miles, was greater because of heavier loading.

Production of new railroad cars has fallen below the number retired from service each year. During August 2,135 cars were produced compared with the high of 10,552 in April. Retirement of worn-out rolling stock has decreased considerably from the annual average of 86,978, which meant a retirement of about 6% of equipment in use. This write-off has been reduced to about 3%, which will mean that, on basis of current figures, about 15,000 to 17,000 more cars will be retired each year than will be produced.

Electric Output: Electric Power production during week ending October 3rd was a little below preceding week, but was 10.6% above corresponding week of 1941. Percentage gains over a year ago in the various regions were: New England, 1.4%; Middle Atlantic, 4.2%; Central Industrial, 6.3%; West Central, 10.2%; Southern States, 15.3%; Rocky Mountain, 9.0%; Pacific Coast, 29.1%. During the five weeks of September production for the entire country averaged about 12.8% over corresponding period in 1941.

Construction: According to the F. W. Dodge Corp., new construction projects continued in large volume through August. Total building and engineering contracts awarded in the 37 eastern states amounted to $721,028,000. This was the fourth largest total on record, being exceeded only in August of last year and June and July of this year.

According to "Engineering News Record" engineering construction volume during September totaled $712,709,000, the highest September value ever reported. The month's total was 39% over last year but declined 12% from last month. Federal construction accounted for 91% of September volume and rose 78% above a year ago. Despite a drop of 64% in State and municipal work, public construction was 53%.

Retail Trade: According to the Federal Reserve Board dollar sales to consumers in August were somewhat lower than the unusually large sales a year ago, when there was a considerable amount of anticipatory buying, while average prices were about 12% higher. On the basis of physical volume, therefore, sales were smaller than a year ago.

Commodity Prices: The general wholesale price index of the Federal Reserve Board advanced during August and first half of September about half a point to 99.2% of the 1926 average, reflecting chiefly increases in prices of livestock products. Price of wheat, flour, and some other uncontrolled commodities also rose from middle of July to middle of September. Prices of uncontrolled food advanced. Retail food prices continued to rise from July through September.

MONTHLY STATISTICS (cont'd)

	July 1942	July 1941	June 1942	June 1941	May 1942	May 1941
FERTILIZER, (Cont'd)						
Superphosphate e (Nat. Fert. Association)						
Production, total	.....	.....	390,081	307,907	383,617	341,348
Shipments, total	.....	.....	266,236	272,209	463,299	538,863
Northern area	.....	.....	139,076	156,903	264,886	370,551
Southern area	.....	.....	127,160	115,306	198,413	168,312
Stocks, end of month, total	.....	.....	.....	.....	802,975	863,633
Tag Sales (short tons, Nat. Fert. Association)						
Total, 17 states	.....	.....	159,520	143,548	329,942	331,697
Total, 12 southern	.....	.....	147,729	103,774	287,625	257,582
Total, 5 midwest	.....	.....	11,791	39,774	42,317	74,115
Fertilizer employment *i*	.....	.....	.....	.....	123.8	127.1
Fertilizer payrolls *i*	.....	.....	.....	.....	147.5	127.4
GENERAL:						
Acceptances outst'd'g *f*	.....	.....	.....	.....	177	219
Coal prod., anthracite, tons	.....	.....	.....	.....	4,843,000	3,858,000
Coal prod., bituminous, tons	....	.....	.....	.....	48,250,000	42,892,000
Com. paper outst'd'g *f*	.....	.....	.....	.....	373	274
Failures, Dun & Bradstreet	.....	.....	.....	.....	938	1149
Factory payrolls *i*	.....	.....	.....	.....	192.6	144.1
Factory employment *i*	.....	.....	.....	.....	137.0	124.9
GENERAL MANUFACTURING:						
Automotive production	No Longer Available		.....	.....	.....	.....
Boot and shoe prod., pairs	.....	.....	39,779,598	40,462,810	40,770,899	41,087,435
Bldg. contracts, Dodge *i*	.....	.....	.....	.....	673,507,000	548,700,000
Newsprint prod., U. S. tons	.....	.....	79,386	83,962	80,040	90,913
Newsprint prod., Canada, tons.	.....	.....	242,762	273,697	251,831	284,767
Glass containers ,gross‡	.....	.....	6,722,950	6,166	7,191,675	6,246
Plate glass prod., sq. ft.	.....	.....	4,726,000	18,533,000	4,310,000	18,394,000
Window glass prod., boxes	.....	.....	1,223,000	1,304,000	1,557,000	1,281,000
Steel ingote prod., tons	.....	.....	.....	.....	7,386,890	7,044,565
% steel capacity	.....	.....	.....	.....	98.2	98.5
Pig iron prod., tons	No Longer Available		.....	.....	.....	.....
U.S. cons'pt. crude rub., lg. tons	No Longer Available		.....	.....	.....	.....
Tire shipments	No Longer Available		.....	.....	.....	.....
Tire production	No Longer Available		.....	.....	.....	.....
Tire inventories	No Longer Available		.....	.....	.....	.....
Cotton consumpt., bales	.....	.....	966,940	875,812	957,015	923,518
Cotton spindles oper.	.....	.....	23,090,560	22,994,980	23,120,666	22,980,286
Wool consumption *s*	.....	.....	50.9	55.7	47.0	57.0
Rayon deliv., lbs.	.....	.....	38,900,000	38,300,000	37,600,000	40,200,000
Rayon employment *i*	.....	.....	.....	.....	312.4	323.5
Rayon payrolls *i*	.....	.....	.....	.....	391.3	356.2
Soap employment *i*	.....	.....	.....	.....	87.3	92.2
Soap payrolls *i*	.....	.....	.....	.....	131.3	125.7
Paper and pulp employment *i*	.....	.....	.....	.....	128.3	122.7
Paper and pulp payrolls *i*	.....	.....	.....	.....	171.7	145.6
Leather employment *i*	.....	.....	.....	.....	93.5	89.6
Leather payrolls *i*	.....	.....	.....	.....	122.1	97.6
Glass employment *i*	.....	.....	.....	.....	123.3	124.0
Glass payrolls *i*	.....	.....	.....	.....	164.9	150.3
Rubber prod. employment *i*	.....	.....	.....	.....	94.7	106.4
Rubber prod. payrolls *i*	.....	.....	.....	.....	134.8	128.7
Dyeing and fin. employment *i*	.....	.....	.....	.....	135.8	141.2
Dyeing and fin. payrolls *i*	.....	.....	.....	.....	151.9	133.9
MISCELLANEOUS:						
Oils & Fats Index ('26=100)[1]	.....	.....	.....	.....	.....	.....
Gasoline prod., *p*	.....	.....	.....	.....	.....	.....
Cottonseed oil consumpt., bbls.	.....	.....	194,105	318,152	198,655	373,170
PAINT, VARNISH, LACQUER, FILLERS:						
Sales 680 establishments, dollars	.....	.....	$43,981,828	$54,336,429	$49,204,268	$58,413,147
Trade sales (580 estabts.) dollars	.....	.....	$22,430,391	$28,049,452	$26,000,489	$32,517,730
Industrial sales, total, dollars	.....	.....	$17,080,263	$21,022,220	$18,140,194	$20,544,155
Paint & Varnish, employ. *i*	.....	.....	.....	.....	135.8	141.4
Paint & Varnish, payrolls *i*	.....	.....	.....	.....	175.7	170.4

a Bureau of Mines; *b* Crude and refined plus motor benzol, Bureau of Mines; *c* Based on 1 lb. of gun cotton to 7 lbs. of solvent, making an 8-lb. jelly; *d* 000 omitted, Bureau of Foreign & Domestic Commerce; *e* Expressed in equivalent tons of 16% A.P.A.; *f* 000,000 omitted at end of month; *i* U. S. Dept. of Labor, 3 year average, 1923-25 = 100, adjusted to 1937 Census totals; *j* 000 omitted, 37 states; *p* Thousands of barrels, 42 gallons each; *q* 680 establishments, Bureau of the Census; *r* Classified sales, 580 establishments, Bureau of the Census; *s* 53 manufacturers, Bureau of the Census, in millions of lbs.; *t* 387 identical manufacturers, Bureau of the Census, quantity expressed in dozen pairs; *v* In thousands of bbls., Bureau of the Census; ** Indices, Survey of Current Business, U. S. Dept. of Commerce; *z* Units are millions of lbs.; ‡ 000 omitted; * New series beginning March, 1940; [1] Revised series beginning February, 1940.

Corn Products Nets $1.30

Corn Products Refining Co. and its subsidiary sales companies in a report for the six months ended June 30, 1942, subject to audit and year-end adjustments, show a net profit of $4,160,660 after depreciation, federal income and excess profits taxes of $10,810,000, etc., equal after dividend requirements on the 7% preferred stock, to $1.30 a share on 2,530,000 shares of common stock. Report states that the excess profits tax has been figured at 87½% and the normal income tax at 45%.

This compares with net profit for the six months ended June 30, 1941, after provision of $4,330,000 for federal income and excess profits taxes, of $4,878,641, equal to $1.59 a common share.

For the quarter ended March 31, 1942, company reported net profit of $2,151,344 or 68 cents a common share.

Davison Chemical Earns $2.09

Davison Chemical Corp. and subsidiaries in a report for the fiscal year ended June 30, 1942, certified by independent auditors show net income of $1,077,281 after charges, provision of $514,957 for federal income taxes and a reserve of $250,000 for possible reduction in inventory values. The above net is equal to $2.09 a share (par $1) on 514,134 shares of capital stock.

This compares with net income of $652,311, or $1.26 a share, in the preceding year, when $129,036 was charged out for federal taxes.

The provision made in the past year for federal and state income taxes, the report states, has been computed under the provisions of the Revenue Act of '41 and under a settlement entered into with the Bureau of Internal Revenue as to the basis of valuation of assets for tax purposes. The amounts provided are believed to be adequate, but the liabilities are subject to review by the Treasury Department. No provision has been made for Federal excess profits tax, as on a consolidated basis, no liability is expected.

U. S. Smelting & Mining Co. Profit, $3,699,708

United States Smelting, Refining & Mining Co. reports for the eight months ended Aug. 31, 1942, an estimated consolidated net profit of $3,699,708 after federal income taxes, depreciation, depletion, amortization, etc., equivalent after dividend requirements on 7% preferred stock, to $4,93 a share on the 528.765 shares (par $50) of common stock.

This compares with $2,806,630 or $3.24 a common share for the eight months ended Aug. 31, 1941.

United States income taxes for the first eight months of 1942 were computed at 45%, compared with 31% in the like 1941 period. No provision was made for excess profits taxes as it is believed that none will be required.

Dividends and Dates

Name	Per Share	Stock Record	Payable
Abbott Laboratories, 4% pref., (quar.)	$1.00	10-1	10-15
Air Reduction Co., (quar.)	.25	10-3	10-15
Extra	.25	10-3	10-15
Amer. Distilling Co., 5% pref.	.25	10-22	11-2
5% pref. (clears all arrears)	.75	10-22	11-2
Amer. Viscose Corp., com.	.50	10-19	11-2
5% pref. (quar.)	1.25	10-19	11-2
Amer. Zinc, Lead & Smelting Co., 5% Conv. prior pref.	1.25	10-20	11-2
Chem. Fund, Inc. (irregular)	.07	9-30	10-15
Chem. Prod. Corp., 7% pref. (quar.)	1.75	9-21	10-1
Colgate-Palmolive-Peet. Com., (quar.)	1.25	10-20	11-15
$4.25 pref. (quar.)	1.06¼	12-8	12-31
Com. Alcohols, Ltd., Com. (quar.)	.05	9-30	10-15
8% pref. (quar.)	.10	9-30	10-15
Consol. Chem. Ind., Inc. $1.50 Curn. partic. pref. classA(qtr.)	.37½	10-1	11-2
du Pont (E.I.) de Nemours & Co., $4.50 pref. (quar.)	1.125	10-9	10-24
Hercules Powder Co. 6% pref. (quar.)	1.50	11-2	11-14
Interchemical Corp., com. (quar.)	.40	10-21	11-1
6% pref. (quar.)	1.50	10-21	11-1
Monsanto Chemical Co. $4.50 pref. A (Semi-annual)	2.25	11-10	12-1
$4.50 pref. B (Semi-annual)	2.25	11-10	12-1
$4.50 pref. C (Semi-annual)	2.00	11-10	12-1
Mutual Chem. Co. of Amer. 6% pref. (quar.)	1.50	12-17	12-28
Parke Davis & Co.	.30	10-14	10-31
Sharp & Dohme, Inc. $3½ cl. A pref. (quar.)	.875	10-16	11-2
Squibb (E.R.) & Sons, $5 pref. (quar.)	1.25	10-15	11-2
Westvaco Chlorine Prods., $4.50 pref. (quar.)	1.125	10-10	11-2

Earnings Statements Summarized

Company:	Net income 1942	Net income 1941	Common share earnings 1942	Common share earnings 1941
Aluminum Industries, Inc—Year, June 30	$ 306,029	*.....	$3.09	....
Celotex Corp.—Nine months, July 31	837,940	$1,208,704	1.14	$1.72
Davison Chemical Corp.—Year, June 30	1,077,281	652,311	2.09	1.26
Masonite Corp.—Twelve weeks, August 31	151,251	830,801	.21	1.49
Masonite Corp.—Year, August 31	1,448,434	2,010,886	2.39	3.56
North Amer. Rayon Corp.—Twelve weeks, Sept. 5	292,881	399,308	c.53	c.74
North Amer. Rayon Corp.—Thirty-six weeks, Sept. 5	878,638	1,172,248	c1.59	c2.16
U. S. Smelting, Ref. & Mng. Co.—Eight months, Aug. 31	3,699,708	2,806,630	4.93	3.24

a On Class A shares; *b* On Class B shares; *c* On Combined Class A and Class B shares; *d* Deficit. *f* No common dividend; *j* On average number of shares; *k* For the year 1940; *b* On Preferred stock; On Class A shares; *y* Amount paid or payable in 12 months to and including the payable date of the most recent dividend announcement; ‡ Indicated quarterly earnings as shown by comparison of company's reports for the 6 and 9 months periods; § Plus extras; *n* Preliminary statement; *h* On shares outstanding at close of respective periods; ** Indicated quarterly earnings as shown by comparison of company's reports for 1st quarter of fiscal year and the six months period; ‡‡ Indicated earnings as compiled from quarterly reports; † Net loss; * Not available; ¶¶ Before interest on income notes; *x* Paid on or declared in last 12 months plus extra stock; *w* Last dividend declared, period not announced by company.

Price Trend of Representative Chemical Company Stocks

	Sept. 5	Sept. 12	Sept. 19	Sept. 26	Oct. 3	Net gain or loss last mo.	Price on Oct. 4, 1941	1942 High	1942 Low
Air Reduction Co.	32½	32¾	33¼	35	35¾	+ 3¼	40½	38¼	29½
Allied Chemical & Dye Corp.	132½	131½	131½	133	137	+ 4½	162	149	118½
Amer. Agric. Chem.	21½	22¼	20½	22¼	22	+ ½	19	23⅜	18¾
Amer. Cyanamid "B"	33¾	33⅜	33½	35¼	36½	+ 2¾	40	41⅞	28⅝
Columbian Carbon	73½	72	73	73	75	+ 1½	83½	75	51
Commercial Solvents	9	8⅞	9	9¼	9¾	+ ¾	10½	10¼	7¼
Dow Chemical Co.	115	114¾	116	118½	119	+ 4	114⅞	124¼	95
du Pont	113¾	112¾	113⅞	118	121¾	+ 8	153¾	144	102¾
Hercules Powder	60¼	60	59⅞	60	61	+ ¾	71½	72	51
Mathieson Alkali Works	24	24	24¼	24	23	— 1	.....	24½	19
Monsanto	76	75¼	77	76½	78	+ 2	89½	91	66
Standard Oil of N. J.	38½	38⅛	39⅜	39⅞	41	+ 2½	42⅛	43¾	30½
Texas Gulf Sulphur	31½	31¾	31⅞	33½	34⅞	+ 3⅜	36⅜	35¾	28
Union Carbide & Carbon	68¼	67¾	69¼	72¼	72¾	+ 4½	76	74¾	58
United Carbon Co.	47½	47	46½	48¾	49¼	+ 1¾	52	51¾	37
U. S. Industrial Alcohol	31⅛	31½	31⅝	32¾	32¼	1⅛	31	34¼	24½

Penn Salt Earns $9.47

Net sales of $19,552,300, largest in the company's history, for the year ending June 30, 1942, and net earnings after taxes of $1,421,170, equal to $9.47 per share, were announced September 28th by Pennsylvania Salt Manufacturing Co., in its annual report to stockholders.

Sales were 19.7% above the preceding year, but this increase was accompanied by a decrease of 13.8% in earnings. The report attributes this to higher production costs and taxes without a commensurate increase in selling prices.

The effect of taxes on the company's earnings for the past ten years is shown in the report. Taxes rose from $149,393 in 1933 to $2,596,516 in 1942.

The report disclosed that the company's production of chemicals which are fundamental in many different industries for the production of finished products entering into everyday life are supplied to 19 different industries. The company produces 28 fundamental chemicals, in addition to many chemical specialties.

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Chemical Stocks and Bonds

PRICE RANGE 1942 September Last	1942 High	1942 Low	1941 High	1941 Low	1940 High	1940 Low	Stocks	Par $	Shares Listed	Dividends 1941*	Earnings** $-per-share-$ 1941	1940	1939
NEW YORK STOCK EXCHANGE													
47	49⅞	37	55¾	46	70¼	49¼	Abbott Labs.	No	755.204	1.60	2.90	2.89	2.61
35	38¼	29¼	45	34⅝	58¼	36½	Air Reduction	No	2.736.855	2.00	2 62	2 38	1 98
134	149	118½	167½	135	183	135½	Allied Chem. & Dye	No	2,401,288	6.00	9 67	9.43	9 50
21½	23⅝	18⅝	22⅞	14⅝	21	12¼	Amer. Agric. Chem.	No	627 981	1.45	1 79	1.45	1.22
34	35	27⅝	35	26	35½	23	Archer-Dan.-Midland	No	545 416	1.85	5.69	5.42	3.02
52⅞	70	43	72¼	61	80½	57	Atlas Powder Co.	No	254 827	4.50	6 13	5 71	3 82
114½	116	111	121	111	124¾	113½	5% conv. cum. pfd.	100	68 597	5 00	27 77	26 01	18.94
21½	21¼	15	29⅝	18½	35½	20	Celanese Corp. Amer.	No	1,376,551	2.00	3 43	2 90	3 53
116¼	120⅜	110	122½	116¾	131	105½	prior pfd.	100	164 818	7.00	35.08	38.69	38.67
15	15⅜	11½	16¼	10⅞	20	10⅛	Colgate-Palm.-Peet	No	1.962 087	0 50	3.09	1.62	2.74
73¼	75	51	83	64	98¾	71	Columbian Carbon	No	537.406	4.70	6.57	5.71	5 32
9⅛	9¾	7¼	11⅞	7½	16⅝	8	Commercial Solvents	No	2.636.878	0 55	.99	.91	.61
49⅞	55¾	42¼	55¾	42¼	65¼	40¼	Corn Products	25	2.530 000	3.00	3.37	3.10	3.32
176	177½	159	182½	164	184	165	7% cum. pfd.	100	245 738	7 00	41.78	7.23	7.70
16½	21	14	21	12¼	23¾	12½	Devoe & Rayn. A.	No	95 000	1 00	7 08	1 14	2.08
117⅛	124¼	95	141¾	111⅛	171	127¼	Dow Chemical	No	1.135 187	3.00	6.58	6.65	3.76
119	144	102¾	164¾	125½	189¼	146½	DuPont de Nemours	20	11.065 762	7 00	7 50	7 23	7 70
126	126½	120	127	120¾	129¾	114	4½% pfd.	No	1.688 850	4.50	53.53	51 48	52.25
134⅛	141	108	145½	120¼	166¾	117	Eastman Kodak	No	2.488 242	6.00	8.57	7 96	8.55
174	176	170	183½	160	180	155	6% cum.	100	61 657	6.00	350 14	325 62	337 65
36	38¾	27	41	32½	39¼	34¾	Freeport Sulphur	10	796 380	2.00	3 95	3.81	2.76
3⅜	5¾	3⅝	7½	4⅞	10	5½	Gen. Printing Ink	1	735 960	0.65	1.00	.86	.94
13¼	15	12⅛	17⅞	11	19⅜	11	Glidden Co.	No	829 989	1.50	3 08	1.56	1.70
38⅝	44	37⅝	46	35	45	30	4½% cum. pfd.	50	199 940	2.25	15 08	8 64	9.27
91	93½	79¼	96	76	112⅛	89⅞	Hazel Atlas	25	434 409	5 00	6.63	5 98	6.60
60	72	51	80¼	65¼	100½	69	Hercules Powder	No	1,316 710	3 00	4 23	4 01	3 65
130	132	125	132½	123½	133¼	126¼	6% cum. pfd.	100	96 194	6 00	69.71	66 38	60.87
23¼	27	21	29⅞	20⅝	29	16⅝	Industrial Rayon	No	759 325	2.50	3 04	3 51	1.77
20¼	23½	19	27	19	47⅝	21¼	Interchem.	No	290 320	1.60	6 01	2.47	4.10
104¼	111½	100⅝	118¼	107	113	91	6% pfd.	100	65 661	6.00	32.79	16.99	24.27
8	8½	3½	..	..	..	..	Intern. Min. & Ch.	5	473 981	...	...	...	...
49½	50	38	..	..	..	..	4% cum. pfd.	100	100 000	...	...	...	...
28¼	28⅝	24⅛	31⅝	23	28⅞	19⅝	Intern. Nickel	No	14.584 025	2.00	2.22	2.30	2.39
42	48¼	39	49	38¼	39⅝	26⅞	Intern. Salt	No	240 000	3.00	3 76	3 98	1.92
21⅞	22¼	17½	22	17¼	23⅝	14⅝	Kellogg (Spencer)	No	509 213	1.70	3.66	2.74	1 30
26	26⅜	20½	45⅝	19½	53¾	30	Libbey Owens Ford	No	2,513 258	3.50	3.52	3.97	3.21
14⅜	15½	11⅜	16⅝	13	18⅝	10⅛	Liquid Carbonic	No	728 100	1.00	2.92	2.21	1.62
22¾	29½	19½	31¼	24¼	25⅝	21	Mathieson Alkali	No	828 171	1.50	1.90	1 72	1 12
76½	91	66	94	77	119	79	Monsanto Chem.	No	1,241 816	3.00	4.90	4 32	4.01
115½	117½	110	118½	112	119	110	4½% pfd A.	No	50.000	4.50	38 43	57 38	54 29
115	119	112	123	115	123	113½	4½% pfd B.	No	50 000	4.50	38 43	57.38	54.29
109	110⅜	102½	113½	108⅞	...	...	4 % pfd. C.	No	50 000	4.50	38.43	...	...
13	16¼	11⅞	19¼	12¼	25⅛	14⅛	National Lead	10	3,090 664	0.50	1 10	1 34	1 23
157	168	145	176	100¼	176	160	7% cum. "A" pfd.	100	213 793	7.00	24 68	28 54	27 04
136	146	129	154	138	159¾	152	6% cum. "B" pfd.	100	103 277	6.00	49 99	59 46	55.30
32	35	29½	36	26	44	28¾	National Oil Products	4	179 829	1 95	4.11	3 92	3.89
8½	11⅜	7¼	11⅞	8⅝	14¼	6¼	Newport Industries	1	621.359	0.75	1 14	0 50	0 66
49½	54	43¼	54	38¾	64⅝	42	Owens-Illinois Glass	12.50	2 661 204	2.50	3.40	2.71	3.17
49	52	42	61½	47½	71⅝	53	Procter & Gamble	No	6.409 418	2.00	4.20	4 37	3.80
118⅞	121½	115	120	115	118¼	112¼	5% pfd.	100	169.517	5.00	324 38	336 78	298.55
14⅞	15	10⅛	16⅜	10⅛	13¼	7⅝	Shell Union Oil	No	13.070 625	1.00	1.33	1 05	0.77
27	28½	19⅜	35¼	18⅞	23¼	13¼	Skelly Oil	No	981 349	1.50	6.03	3.28	1.99
24⅛	27½	20	34¼	24⅞	29	20¾	S. O. Indiana	25	15 272 020	1.00	3.17	2.20	2.24
39½	42¼	30⅛	46⅞	33	46½	29⅞	S. O. New Jersey	25	27.278.666	1.00	5.15	4.54	3 27
8¾	9⅝	7⅛	9⅜	6	9¼	4¼	Tenn. Corp.	5	853 696	1.00	1 60	1.36	0.41
37½	39¼	30	46⅝	34¼	47⅝	33	Texas Corp.	25	10.876 882	2.00	4.77	2 90	3.03
33⅛	34⅞	28	38⅞	30¼	37¼	26⅞	Texas Gulf Sulphur	No	3.840.000	2.50	2.35	2.38	2.04
72	74⅜	58	79⅞	60	89⅝	59⅞	Union Carbide & Carbon	No	9.277 288	3.00	4.53	4.55	3.86
49	49¾	37	53	35	63⅝	42½	United Carbon	No	397.885	3.00	4.30	3.36	3.81
31⅞	34¼	24½	34¼	20	23	14	U. S. Indus. Alcohol	No	391 238	1.00	...	2.73	1.06
16⅝	20⅞	14⅛	34⅛	15⅛	43⅞	25	Vanadium Corp. Amer.	No	405 706	1.50	3.03	2.85	3 25
21¼	25¼	18⅝	27¼	20	31½	14	Victor Chem.	5	750.000	1.40	1.59	1 57	1.59
1⅞	2¼	1	2½	⅝	4½	1⅝	Virginia-Caro. Chem.	No	486.122	...	—1 89	—1 36	—1.57
32½	37	22½	29½	18⅞	31⅝	14	6% cum. part. pfd.	100	213 052	1.00	1 69	2 89	2.41
26½	31½	22	36½	27¼	38½	27¾	Westvaco Chlorine	No	553.132	1.85	2.92	2 96	2.91
107¾	107¾	100½	112	105	109⅝	108	cum. pfd.	No	58,415	4.50	22.19	21.98	...
NEW YORK STOCK EXCHANGE													
35¼	41⅞	28⅝	42⅜	31	39⅞	26	Amer. Cyanamid "B"	10	2 618 387	0 60	2 42	2.44	2.07
7⅛	8	6½	7¾	6⅞	8⅛	5	Duval Texas Sulphur	No	500 000	1.25	1.42	1 16	1 25
68¼	88½	67½	99	65	92	60	Heyden Chem. Corp.	100	104 383	3 00	9 04	7 86	5.98
72	73½	58¼	96¼	55	104	65	Pittsburgh Plate Glass	25	2.188 040	5 00	6 82	6.30	4.94
74½	78¼	59¾	84	61	100	62½	Sherwin Williams	25	638 927	3.00	7 83	6.57	5 96
112¼	115	110	115½	108½	114¾	106	5% cum. pfd.	50	122 289	5.00	47.82	39.49	35.08
PHILADELPHIA STOCK EXCHANGE													
141½	175½	125	185	162	192	158¾	Pennsylvania Salt	50	150.000	8.00	10.99	11.51	8.63

PRICE RANGE 1942 September Last	1942 High	1942 Low	1941 High	1941 Low	1940 High	1940 Low	Bonds	Date Due	Int. %	Int. Period	Outstanding $
NEW YORK STOCK EXCHANGE											
103½	104¼	101⅝	104½	100⅝	105¼	100½	Amer. I. G. Chem. Conv.	1949	5½	M-N	$22 400 000
47	47	34	42¼	26½	41	27½	Anglo Chilean Nitrate inc. deb.	1967	4½	J	10 400 000
48	48¾	35	40	25⅜	39¾	27	Lautaro Nitrate inc. deb.	1975	4	J-D	27 200 000
97½	97⅞	95⅝	99⅞	94¾	100¼	93½	Shell Union Oil	1954	2½	J-J	85 000 000
105¼	105½	103	106¾	102½	107	101½	Standard Oil Co. (New Jersey) deb.	1961	3	J-D	85 000 000
105	105⅝	103⅜	150⅝	103	107	100⅝	Standard Oil Co. (New Jersey) deb.	1953	2¾	J-J	50 000 000
105⅝	106	104½	107¾	102⅞	108¼	102	Texas Corp.	1959	3	A-O	40,000,000

* Including extras paid in cash.
** For either fiscal or calendar year.
x New stock.

New Trade Marks of the Month

Trade Mark Descriptions†

397,729. The W. S. Tyler Company; Cleveland, O.; Aug. 5, '41; for adhesive cement for applying edging to screen cloth; since July 28, '41.

398,091. William Cooper & Nephews, Inc.; Chicago, Ill.; July 28, '41; for animal insecticide; since July 13, '41.

424,801. Facerform Corp.; Ridgewood, N. J.; Oct. 23, '39; for fertilizers; since Oct. '33.

445,400. Turco Products, Inc.; Los Angeles, Calif; July 16, '41; for chemical cleaning compound adapted for dissolving and removing foreign matter from metal surfaces prior to processing in the course of manufacturing and other industrial operations; since Sept. 14, '39.

444,881. Purepac Corp.; New York, N. Y.; June 26, '41; for mineral oil for internal use; since May 1, '41.

445,226. Cardox Corp.; Chicago, Ill.; July 10, '41; for sodium chlorate, potassium chlorate, and potassium perchlorate; since June 28, '41.

446,230. Martinus J. Dyrud (Dyrud Laboratories); Prarie du Chien, Wis.; Aug. 14, '41; for dry cleaning preparation and a glass cleaner; since March, '41.

448,592. Turco Products, Inc.; Los Angeles, Calif.; Nov. 12, '41; for paint removing preparations—namely, paint removers; since Jan. 1, '37.

449,126. Colt's Patent Fire Arms Mfg. Co.; Hartford, Conn.; Dec. 3, '41; for synthetic resin molding compounds; since Nov. 21, '41

449,615. Lewiston Corporation Laboratories; New York, N. Y.; Dec. 19, '41; for radon compound suppositories consisting predominantly of a fatty vehicle and containing radon since Dec. 1, '41.

450,762. The Firestone Tire & Rubber Company; Akron, O.; Feb 5, '42; for chlorine-containing rubber compounds including rubber chloride and rubber hydrochloride; since Nov. 26, '41.

452,057. Ridbo Laboratories, Inc.; Paterson, N. J.; Mar 31, '42; for compound—namely, modified oils substantially of the consistency of putty for use in the production of rubber articles as a substitute for a part of the rubber; since Mar. 3, '42.

452,666. Binney & Smith Co.; New York, N. Y.; Apr. 29, '42; for carbon black in beaded form for use as an ingredient in the compounding of rubber; since Apr. 10, '42.

453,138. Campfield Manufacturing Company; Grand Haven, Mich.; May 20, '42; for plastic and resin impregnated lumber, plywood, veneered wood, finished plywood panels; since Jan. 1, '41.

453,211. Plee-Zing, Inc.; Chicago, Ill.; May 23, '42; for wallpaper cleaner, glass cleaning preparation, shoe polish, sweeping compound, lemon odor cleanser, cocoa castile soap, granulated soap, laundry soap, soap flakes, shoe whitener, white shoe polish; since Dec. '36 on wallpaper cleaner; since June, '38 on glass cleaning preparation; since July, '38 on shoe polish, shoe whitener and white shoe polish; since Aug. '29 on laundry soap, soap flakes and granulated soap; since Aug. '39 on sweeping compound; and since Jan. '40 on lemon odor cleanser and cocoa castile soap.

453,279. Rubbercraft Corp. of California, Ltd.; Los Angeles, Calif.; May 26, '42; for compound made of rubber and synthetic rubber in sheet or any other form; since Apr. 13, '42.

453,358. American Foundation for Dental Science, San Diego, Calif.; May 29, '42; for concentrated medicinal materials for use as food supplements in supplying deficiencies of vitamins and minerals; since May 9, '42.

453,362. Consolidated Feldspar Corp.; Trenton, N. J.; May 29, '42; for mineral product used as a ceramic flux, such material being, specifically, refined aplite; since Apr. 15, '42.

453,511. Jesse Horowitz (Liks Chemical Co.); Bayonne, N. J.; June 6, '42; for paint deodorant; since Sept. 8, '41.

453,536. Graver Tank & Mfg. Co., Inc.; East Chicago, Ind.; June 8, '42; for zeolitic materials—namely, resinous and carbonaceous zeolites for water purification; since Mar. 26, '42.

453,537. Graver Tank & Mfg. Co., Inc.; East Chicago, Ind.; June 8, '42; for zeolitic materials—namely, greensand for water purification; since Mar. 26, '42.

453,538. Graver Tank & Mfg. Co., Inc.; East Chicago, Ind.; June 8, '42; for zeolitic materials—namely, synthetic siliceous zeolites for water purification; since Mar. 26, '42.

453,539. Graver Tank & Mfg. Co., Inc.; East Chicago, Ind.; June 8, '42; for zeolitic materials—namely, greensand for water purification; since Mar. 26, '42.

453,540. Graver Tank & Mfg. Co., Inc.; East Chicago, Ind.; June 8, '42; for zeolitic materials—namely, carbonaceous zeolites for water purification; since Mar. 26, '42.

453,541. Graver Tank & Mfg. Co., Inc.; East Chicago, Ind.; June 8, '42; for zeolite materials—namely, resinous and carbonaceous materials for water purification; since Mar. 26, '42.

453,949. J. H. Stoddart Co.; Redlands, Calif.; June 29, '42; for phenobarbital and B complex preparation; since June 11, '42.

453,978. The Enbalmers' Supply Company; Westport, Conn.; July 1, '42; for vanishing cream for use in the embalming trade; since Jan. 15, '34.

454,007. S. C. Johnson & Son, Inc.; Racine, Wis.; July 2, '42; for rubber dressing to coat, preserve, renew, and clean all rubber, automotive and household articles; since Apr. 30, '40.

† Trademarks reproduced and described include those appearing in the *Official Gazette of the U. S. Patent Office*, Sept. 8 to Oct. 6, 1942.

New Trade Marks of the Month

Mystery
454,015

FORTURN
454,251

TEMPILSTIK°
454,439

TWENTY-X
454,530

LORODO
454,738

R-P
454,085

ETHIOMINE
454,260

NEO MULTI-VI
454,470

CRYSTOX
454,546

BEVULES
454,747

AERO Lube
454,109

KLEN-O-CIDE
454,303

THIURAD
454,478

LITHOLINE
454,557

ESTROTHYRIN
454,191

SULFAPECTIN
454,338

RIBOJECTAL
454,485

FIREPEL
454,569

NUPLEX
454,748

THIOSAN
454,223

TANNIPECTIN
454,339

RIBOTINIC
454,486

PRIMES
454,749

Texchrome
454,249

CAPATABS
454,342

VITOGEN
454,508

Vicoplex
454,675

Texstrip
454,250

TEMPILAQ°
454,438

DYKON
454,524

CHEK-R-LINEUM
454,698

GARINOL
454,926

Trade Mark Descriptions (*Cont'd.*)

454,008. S. C. Johnson & Son, Inc.; Racine, Wis; July 2, '42; for rubber dressing to coat, preserve, renew, and clean all rubber automotive and household articles; since Apr. 30, '40.

454,009. S. C. Johnson & Son, Inc.; Racine, Wis.; July 2, '42; for liquid wax polish for finishing and coating furniture and interior and exterior finished surfaces; since Aug. 1, '35.

454,015. Plee-Zing, Inc.; Chicago, Ill.; July 2, '42; for soap in granulated form; since Jan. '33.

454,085. Nutritional Research Products, Inc.; Los Angeles, Calif.; July 7, '42; for concentrated medicinal food materials for use as food supplements in supplying deficiencies of vitamins; since Apr. 14, '42.

454,109. American Cyanamid & Chemical Corp.; New York, N. Y.; July 9, '42; for lubricating oil addition agents; since Dec. 10, '41.

454,191. The Harrower Laboratory, Inc.; Glendale, Calif.; July 13, '42; for combination of thyroid and estrogenic substance for oral use; since Feb. 7, '41.

454,223. Bayer-Semesan Company, Inc.; Wilmington, Del.; July 15, '42; for fungicides; since June 2, '42.

454,249. Fisher Scientific Company, Pittsburgh, Pa.; July 16, '42; for a solution employed to identify natural and synthetic textile fibers; since July 14, '42.

454,250. Fisher Scientific Company, Pittsburgh, Pa.; July 16, '42; for a chemical employed to remove dyes from textile fibers; since July 14, '42.

454,251. Freeda Agar Products; New York, N. Y.; July 16, '42; for vitamin capsules or tablets; since June 30, '42.

454,260. Thos. Leeming & Co., Inc.; New York, N. Y.; July 16, '42; for a germicide; since July 2, '42.

454,303. Federated Foods, Inc. (Federated Foods); Chicago, Ill.; July 18, '42; for a household bleach; since May 22, '41.

454,338. The Harrower Laboratory, Inc.; Glendale, Calif.; July 20, '42; for combination of sulfanilamide and pectin for local use only, designed for direct topical application to the wound or infected area, compound fractures, contaminated industrial wounds, war wounds, ulcers and carbuncles, burns, clean surgical wounds, etc.; since Jan. 15, '42.

454,339. The Harrower Laboratory, Inc.; Glendale, Calif.; July 20, '42; for combination of pectin and tannic acid for external use, principally burns, since Jan. 15, '42.

454,342. Modern Products, Inc.; Milwaukee, Wis.; July 29, '42; for calcium pantothenate tablets; since May 5, '42.

454,438. Tempil Corp.; New York, N. Y.; July 22, '42; for temperature indicating fluid materials made of chemical compounds, chemical elements, eutectics, pure metals and alloys which possess sufficiently sharp melting points or melting point ranges to indicate specific temperatures or temperature ranges in subdivided form suspended or dissolved in a quick drying vehicle or solvent; since Apr. 15, '42.

454,439. Tempil Corp.; New York, N. Y.; July 22, '42; for temperature indicating pencils, or crayons, made of chemical compounds, chemical elements, eutectics, pure metals and alloys which possess sufficiently sharp melting points or melting point ranges to indicate specific temperature ranges by their melting; since June 12, '41.

454,470. White Laboratories, Inc.; Newark, N. J.; July 23, '42; for vitamins in tablet form, capsule form, and liquid form; since July 20, '42.

454,478. Monsanto Chemical Company, St. Louis, Mo.; July 24, '42; for compounds used as vulcanization accelerators in the curing of rubber articles; since Aug. 24, '34.

454,485. Abbott Laboratories, North Chicago, Ill.; July 25, '42; for vitamin preparation; since July 14, '42.

454,486. Abbott Laboratories, North Chicago, Ill.; July 25, '42; for vitamin preparation; since July 14, '42.

454,508. The G. F. Harvey Company, Saratoga Springs, N. Y.; July 25, '42; for therapeutic powder for antiseptic dusting; since 1896.

454,524. Stein, Hall Manufacturing Co.; Chicago, Ill.; July 25, '42; for rope and mold inhibitor sold as a powder preparation for use in preparing bakery products and other products susceptible to the growth of rope and mold; since Aug. 11, '41.

454,530. California Spray-Chemical Corp.; Wilmington, Del., and Richmond, Calif.; July 27, '42; for insecticides; since July 13, '42.

454,546. Shell Chemical Company, San Francisco, Calif.; July 27, '42; for insecticides and compounds for use in insecticides; since June 5, '42.

454,557. Lithographic Technical Foundation, Inc.; New York, N. Y.; July 28, '42; for wash or solvent used in the preparation of lithographic plates and stones, used for asphaltum solutions and residues therefrom, and used for developing inks and residues therefrom and in washing metal and composition rollers; since 1933.

454,569. Ignace Alembik; New York, N. Y.; July 29, '42; for chemical composition to make wood and other fibrous material fire resistant or fireproof; since July 23, '42.

454,675. Vico Products Company, Chicago, Ill.; Aug. 1, '42; for vitamin preparation; since July 15, '41.

454,698. Ralston Purina Company, St. Louis, Mo.; Aug. 3, '42; for insecticide; since July 23, '42.

454,738. Parfum L'Orle, Inc.; New York, N. Y.; Aug. 5, '42; for deodorant in solid form; since June 22, '42.

454,747. Vick Chemical Company, Wilmington, Del.; Aug. 5, '42; for vitamin tablets; since July 15, '42.

454,748. Vick Chemical Company, Wilmington, Del.; Aug. 5, '42; for vitamin tablets; since July 21, '42.

454,749. Vick Chemical Company, Wilmington, Del.; Aug. 5, '42; for vitamin tablets; since July 24, '42.

454,926. Garinol, Inc.; New York, N. Y.; Aug. 15, '42; for liquid adhesive for coating glass to provide a transparent film thereover designed to render the glass safe against splintering and scattering; since May 6, '42.

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CHEMICAL INDUSTRIES

Statistical and Technical Data Section

No. 4
Part 2

War Regulations
Priorities, Allocations, Import and Price Controls—p. 35

Summary of War Regulations

There are no more important subjects to the chemical industry today than priorities, allocations, import and price controls. Chemical Industries, last month, chronologically digested the important regulations up to August 31, 1942. This month new regulations are brought up to September 30, 1942. Next month and each month thereafter additional and revised regulations will be given.

By way of explanation a "P" order identifies a limited blanket rating given to a company, or an industry to facilitate the acquisition of scarce materials needed by such companies for defense or essential civilian production.

Distribution of commodities under industry-wide control generally is governed by "M" (material) orders, regulating distribution and flow of a given material into defense or essential civilian production channels.

Limits on the production of materials are covered by "L" limitation orders.

Acetone

September 3, 1942. OPA announces effective date of Maximum Price Regulations Nos. 36 and 37 changed to October 3, to give time for study of changes in market price since original announcement.

Anthraquinone Dyes

September 30, 1942. Civilian quotas for all anthraquinone dyes for the fourth quarter will remain at 70 per cent of 1941 consumption, under provisions of Order M-103, as amended, issued by the War Production Board. The nine anthraquinone dyes previously set aside for military use will continue in this category. Other changes effected by the amended order were: (1) Restrictions on the use of blue and green dyes for coloring leaded gasoline are removed. (2) After November 1, sales and use of Meta Toluylene Diamine in the developing of diazotized dyes is prohibited. Meta Phenylene Diamine can be used as a substitute. (3) Sales and use of anthraquinone as a discharging and stripping agent in textile printing is prohibited. (4) Fast Red A. L. Salt, also known as Alpha Amino Anthraquinone, is placed under the anthraquinone vat dye quota.

Caffeine

September 5, 1942. Caffeine and theobromine, two important medicinal drugs, placed under complete allocation control beginning October 1.

Control is established (Conservation Order M-222) because supplies of cocoa beans, coffee, coffee scrapings, tea waste, and mate, the raw materials from which the drugs are made, have been reduced by the present shipping situation.

Chemical Producers' Supplies

September 19, 1942. Chemical producers were granted new higher preference ratings to enable them to obtain maintenance, repair, and operating supplies by Amendment No. 3 to Preference Rating Order P-89, issued by the Director General for Operations.

Because the chemical industry is in the very heart of war production, particularly in munitions manufacture, it is essential that breakdowns and impairment of production be avoided. P-89 was issued originally to provide chemical producers with preference ratings high enough to insure their getting immediate delivery of supplies to avoid or repair breakdowns. The order has been amended several times to increase the ratings assigned as supplies became more difficult to get.

Amendment No. 3 raises to A-1-a the rating assigned to the industry for obtaining all metals appearing on List No. 1 of Form PD-25 A for the fourth quarter. A similar rating is assigned to fabricated parts and equipment having a unit cost of $250 or less. All other materials needed for maintenance, repair, and operating purposes are assigned an A-1-c.

To repair plant breakdowns and avoid threatened curtailment of production in emergencies, the amendment provides for the assignment of ratings higher than A-1-a upon application, by letter or telegram to WPB, stating all pertinent data.

None of these ratings may be applied to the purchase of metal containers or container materials without specific authorization by WPB. Further conditions of use of these ratings are: Form PD-315 must be filed with WPB; the producer must have a serial number assigned by WPB; the material sought must not be available with a lower rating than assigned by this order; and the materials so bought must not be replaceable by substitutions.

Chromium Chemicals

September 30, 1942. Restrictions on the use of chromium chemicals were removed by the Director General for Operations.

Order M-18-b, as amended June 27, restricted the amounts of chrome chemicals that could be used in the manufacture of pigments, chromic acid, roofing materials, or in tanning leather, and restricted all use in any month to one-twelfth the amount used in the base period.

The new revision of M-18-b removes these restrictions. Inventory is limited to a 30-day supply and regular reports are required on Form PD-54.

Citric Acid

September 24, 1942. Amendment to Revised Price Schedule No. 101 extends automatic license and registration provisions of Supplementary Order No. 11 to distributors of citric acid.

Copper Chemicals

September, 1942. Order M-227, effective October 1, provides for complete allocation control of copper chemicals in order to conserve copper scrap from which they are made. The order lists copper chemicals as copper sulfate, carbonate, chloride, oxide, nitrate, and cyanide.

Cotton Linters

September 5, 1942. Sales of cotton linters and hull fibres by the United States or any of its agencies are not subject to the pricing provisions of Maximum Price Regulation No. 191 (Cotton Linters and Hull Fibres), the Office of Price Administration announced.

This exemption was made, OPA officials explained, in order to facilitate the carrying out of plans made by the War Production Board and the Commodity Credit Corporation for the orderly marketing and conversion into chemical cotton pulp of cotton linters.

Cryolite

September 18, 1942. General Preference Order M-198, effective October 1, issued to provide complete allocation of cryolite with one exception, which is its receipt and use as an insecticide. This exemption was made to avoid placing a great burden of paper work on farmers. To receive or use cryolite, form PD-592 should be used. First request must be accompanied by inventory and consumption form PD-632.

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War Regulations
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Fertilizers

September 23, 1942. The chemical fertilizer order, M-231, was amended by the Director General for Operations to permit unlimited use of nitrogen-bearing fertilizer by the Army, Navy or Coast Guard on new planting of grass on airports or airfields.

Another revision of the order changes Grade 0-20-20 listed under Arkansas on Schedule A to 0-10-20.

Furfural

September 29, 1942. Agricultural components of furfural—a commodity used in making butadiene for synthetic rubber, in refining petroleum crudes and as a plastic binder—have been exempted from price control, the Office of Price Administration announced.

Products affected include cottonseed hulls, cottonseed hull bran, oat hulls and other agricultural commodities which may be used in production of furfural at a later date. Corn cobs, also used in making furfural, have not been under price control previously, but the other named items were under the General Maximum Price Regulation.

This step, effected through Amendment No. 30 to Supplementary Regulation No. 1 under the General Maximum Price Regulation, is necessitated by the fact synthetic rubber demand requires that present productive capacity of furfural be tripled. The amendment becomes effective October 3, 1942.

Glycerine

September 5, 1942. Procedure for glycerine users and producers to file reports and requests for allocations with WPB changed by Amendment No. 1 to General Preference Order M-58. New procedures are to conform to the WPB policy of allocating in advance only shipments of 10,000 pounds or over, and of filling orders from 50 to 10,000 pounds pursuant to directive. The same forms, PD-361, PD-362, and PD-363, are to be used under the new procedure as have been used in the past.

Glycols

September 5, 1942. Order M-215 issued to provide complete allocation control over glycols. Glycols defined to include ethylene glycol, propylene glycol, decthylene glycol, triethylene glycol, and physical mixtures of such glycols.

Phosphorus

September 9, 1942. Order M-230 provides complete allocation control of yellow and white phosphorus, effective Oct. 1. To obtain these materials, form PD-600 should be used, to deliver, form PD-601 should be used. Persons seeking 1,000 lbs. or less in any one month may obtain delivery by certificate to suppliers and need not file PD-600.

Silica Gel

October 1, 1942. General Preference Order M-219 issued by Director General for Operations provides for complete allocation of silica gel. To obtain silica gel, form PD-600 should be used, to deliver, form PD-601 should be used.

Xylol

August 29, 1942. Amendment to Order M-150 provides for complete allocation of aromatic petroleum and coal-tar solvents other than benzol and toluol, effective October 1. Allocation control will not apply to users requiring 60 gallons or less per month. Applications are to be made on form PD-600 by 10th day of month preceding month for which allocation is requested.

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A Complete Check—List of Products, Chemicals, Process Industries

Resins, Plastics*

Production of superpolyamides. No. 2,281,961. Hanns Ufer and August Weickmann to E. I. du Pont de Nemours & Co.

Method incorporating polymerized aliphatic mono-olefins in polymerized styrene which comprises dissolving the polymerized aliphatic mono-olefine in monomeric styrene and then polymerizing the styrene. No. 2,282,002. Thomas R. Scott and Malcolm C. Field to International Standard Elec. Corp.

Rubber*

Process of accelerating vulcanization of rubber which comprises vulcanizing it in the presence of a thiocarbamyl sulfamine wherein the amine group attached to sulfur is a primary amine group. No. 2,285,813. Roy Hanslick to United States Rubber Co.

Process which comprises cold-drawing, into a three-dimensional article, a flat fabric woven from synthetic linear polyamide yarn which is capable of being cold-drawn. No. 2,285,967. Vernal Hardy to E. I. du Pont de Nemours & Co.

Synthetic rubberlike material from 1-cyanobutadiene-1, 3 and butadienes-1, 3. No. 2,284,281. Bernard J. Habgood, Elias Isaacs and Leslie B. Morgan to Imperial Chemical Industries, Ltd.

Method preserving rubber comprises treating rubber with aldehyde reaction product of aliphatic keton-arylamine condensation product and in addition thereto an N, N'-diaryl phenylene diamine as an activator for said reaction product. No. 2,284,284. Louis H. Howland to United States Rubber Co.

Process vulcanizing a rubber in presence of salt in which 2-mercaptothiazoline is combined with a quaternary ammonium compound derived from a heterocyclic nitrogen base. No. 2,284,576. Paul C. Jones and Roger A. Mathes to B. F. Goodrich Co.

Process vulcanizing a rubber in presence of salt in which a 2-mercaptothiazole is combined with a polyamine containing at least two primary amino groups. No. 2,284,577. Paul C. Jones and Roger A Mathes to the B. F. Goodrich Co.

Method heating in presence of N-thioamine and compound which is stable at room temperature but which decomposes at vulcanizing temperatures with the formation of carbon disulfide, a rubber composition comprising a rubber to which sulfur has been added only in a combined form. No. 2,284,578. Paul C. Jones to the B. F. Goodrich Co.

Method vulcanizing a rubber in presence of non-reverting accelerator and thiuram disulfide in absence of added free sulfur. No. 2,284,579. Paul C. Jones to B. F. Goodrich Co.

Dispersion of pigments in rubber. No. 2,284,610. Harold A. Sweet to General Dyestuff Corp.

Method preserving a rubber which comprises treating a rubber with product obtained by reacting indene and a secondary diaryl amine in which only secondary amino groups are present in presence of a condensation catalyst. No. 2,285,032. Joseph R. Ingram to Monsanto Chemical Co.

Vulcanization accelerator. No. 2,285,077. David J. Beaver to Monsanto Chemical Co.

Method retarding deterioration of vulcanized rubber. No. 2,285,259. Frederick B. Downing, Arthur M. Neal and Charles J. Pedersen to E. I. du Pont de Nemours & Co.

Method retarding deterioration of vulcanized rubber. No. 2,285,260. Frederick B. Downing, Arthur M. Neal and Charles J. Pedersen to E. I. du Pont de Nemours & Co.

Textiles*

Process crease proofing fibrous materials which comprises treating said materials with a mixture containing a melamine-formaldehyde resin and N-ethanol stearamide. No. 2,284,609. Paul C. Schroy to American Cyanamid Co.

A viscose spinning solution containing a terpene-maleic anhydride polyhydric alcohol resin as a modifying agent. No. 2,284,839. George A. Paine to Hercules Powder Co.

Process impregnating a cellulose textile material with an isothiocyanate of the formula RNCS in which R is an aliphatic hydro arbon radical containing more than ten carbon atoms, and heating the impregnated material until the material becomes water-repellent. No. 2,284,895. William E. Hanford and Donald F. Holmes to E. I. du Pont de Nemours & Co.

Production of artificial filaments. No. 2,285,245. Ki Williams to E. I. du Pont de Nemours & Co.

Composition for softening and lubricating textile fibers. No. 2,285,357. Edwin A. Robinson to National Oil Products Co.

Cellulose

Process for production of colored cellulose ester or ether materials. No. 2,286,317. Edmund Stanley, George H. Ellis and Henry C. Olpin to Celanese Corp. of Amer.

Process of flameproofing cellulosic material and products thereof. No. 2,286,726. Wallace Em. Gordon to E. I. du Pont de Nemours & Co.

Process of fireproofing a cellulosic-base material. No. 2,286,744. Martin Leatherman.

Recovery of cellulose esters from scrap. No. 2,286,822. Carl J. Malm and Gustave B. Bachman to Eastman Kodak Co.

Process for coloration of textile materials of an organic derivative of cellulose which comprises applying thereto 2:6-dichlor-4-nitro-2'-chlor-4'-amino azobenzene. No. 2,287,124. Henry C. Olpin and John Wright to Celanese Corp. of Amer.

Coated cellulosic products and method for producing same. No. 2,287,161. Robert W. Ball to E. I. duPont de Nemours & Co.

Process for selective destruction of cellulose ester component of a mixed fabric containing cellulose ester fibers, which comprises treating same with a polyhydroxy phenol. No. 2,287,696. Charles Franklin Miller to E. I. du Pont de Nemours & Co.

Method of treating borosilicate glasses. No. 2,286,275. Harrison P. Hood and Martin E. Nordberg to Corning Glass Works.

Manufacture of organic derivatives of cellulose materials. No. 2,287,897. Hervert Martin to Celanese Corp. of America.

Process for the production of water-soluble cellulose ethers in powder form. No. 2,288,200. Georg Meyer.

Pellicle of hydrophilic cellulosic material. No. 2,288,413. Willard Morgan to Sylvania Industrial Corp.

Ceramics, Refractories

Baked but unburned slip-cast ceramic product consisting essentially in its finished form of a major portion of ceramic material including plastic clay, and 5 to 20 per cent of a resin. No. 2,288,047. John D. Sullivan and Chester Austin to Battelle Memorial Institute.

Process of reclaiming safety glass. No. 2,288,524. Frank W. Hall to Pittsburgh Plate Glass Co.

Chemical Specialty

Aluminum soldering flux. No. 2,286,298. Mike A. Miller to Aluminum Co. of Amer.

Process producing coffee-extract which comprises extracting ground roasted coffee with ethylene oxide and removing ethylene oxide from the extract. No. 2,286,334. Robert L. Brandt to Coffee Products Corp.

Drawing compound comprising an intimate mixture of 1% to 50% of a finely divided proteinous meal containing substantially no added water of the class consisting of peanut meal, flaxseed meal, soybean meal, pecan meal and cocoa bean meal and 99% to 50% of a neutral petroleum lubricating oil having a Saybolt viscosity of 100" to 750" at 100 degrees F. No. 2,286,433. James E. Montgomery.

Polymerized chloroprene adhesive. No. 2,286,505. John L. Perkins to B. B. Chemical Co.

Insecticide containing as its essential active ingredient a mixture of rubber, poisonous liquid alkaloids, and oil. No. 2,286,636. Charles W. Murray to Claude R. Wickard.

Tobacco to which has been added a small amount of a product of the direct reaction of an aldose with ammonia. No. 2,286,639. Emil Ott to Hercules Powder Co.

Chewing gum material comprising a resinous material selected from group consisting of polymerized rosin and polyhydric alcohol esters thereof. No. 2,286,712. Joseph N. Borglin to Hercules Powder Co.

Antifouling composition. No. 2,298,218. George H. Young and Peter Gray to Stoner-Mudge, Inc.

Adhesive. No. 2,287,410. Ernest R. Boller to E. I. du Pont de Nemours & Co.

Adhesive. No. 2,287,411. Ernest R. Boller and Raymond F. Remier to E. I. du Pont de Nemours.

Process for obtaining clear extracts from semiliquid mixtures. No. 2,287,444. Max R. Morgenthaler to Ingredeco, Inc.

Urea-phenol-formaldehyde adhesive. No. 2,287,536. Paul O. Powers to Armstrong Cork Co.

Lubricant composition comprising an aqueous carrying medium containing from 10% to 80% of a sulfonamide having an organic radical attached to the sulfur atoms. No. 2,287,639. Wilbur B. Pings to E. I. du Pont de Nemours & Co.

Method of manufacturing confection and product. No. 2,287,838. Joseph Stanley to American Lecithin Co.

Chewing gum base. No. 2,288,100. George Manson to Shawinigan Chemicals, Ltd.

Wax emulsion. No. 2,288,351. Richard Griffith to National Oil Products Co.

Size Emulsion and method of preparing the same. No. 2,288,476. Robert T. Mashburn to Hercules Powder Co.

Coal Tar Chemicals

Process treating asphalt which comprises incorporating with asphalt material small amounts of wood, liquid rosin acids and a sulfate of a metal from the alum-forming aluminum and iron. No. 2,286,244. Charles H. Whitacre to The Standard Oil Co.

Method removing acetylent and other triple bond unsaturates, and compounds containing carbon-to-sulfur double bonds from ethyl chloride. No. 2,286,379. Harold A. Robinson to The Dow Chemical Co.

Method producing an improved asphalt of reduced staining tendency from flux asphalt. No. 2,286,414. Arthur B. Hersberger to The Atlantic Refining Co.

Coke-oven by-product tar and ammonia recovery. No. 2,286,455. Joseph Becker to Koppers Co.

* *Continued from last month (Vol. 538, Nos. 3, 4—Vol. 539, Nos. 1, 2.)*

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A salt of cinnamic acid and an anesthetic ester of group having the general formula of Ar .NH_2.COOR, where Ar stands for an aromatic nucleus of the group of C_6H_4 and C_6H_3 .OH, and R stands for an alkyl or an aryl or an alkamin radicle. No. 2,286,718. David Curtis.

Purification of sulfonic acid products. No. 2,286,725. Paul M. Goodloe to Socony-Vacuum Oil Co., Inc.

Purification of n-methyl-o-aminophenol. No. 2,286,796. Arthur W. M. Dickins and Lewis J. Behrndt to Eastman Kodak Co.

Manufacture of 2-methyl-2-alkoxy-3-halogen tetrahydrofuranes. No. 2,286,884. Kurt Westphal and Hans Andersag to Winthrop Chem. Co., Inc.

Process of preparing oxo compounds of the cyclopentano-polyhydrophenanthrene series. No. 2,286,892. Max Bockmuhl, Gustav Ehrhart, Heinrich Rushig and Walter Ammuller to Winthrop Chemical Co., Inc.

Low temperature carbonization of coal. No. 2,287,427. Carl E. Lesher and John B. Goode to Pittsburgh Coal Carbonation Co.

As a new compound an arylaliphatic ketone having a plurality of -cyanoethyl radicals on an aliphatic carbon atom contiguous to the carbonyl group. No. 2,287,510. Herman A. Bruson to The Resinous Products & Chem. Co.

Process for production of beta-alkoxycarboxylic acids. No. 2,287,537. Hermann Schulz to Chemical Marketing Co., Inc.

Method of producing relatively non-sticky surfaces of asphalt, bitumen, and the like, which comprises placing in immediate juxtaposition with the surface a coating containing effective quantities of pectate. No. 2,287,849. Clarence Wilson to California Fruit Growers Exchange.

Free-flowing crystals of beta oxy naphthoic acid substantially free from lumps, aggregates and fine powder, and having a wetting agent blended therewith. No. 2,287,864. John Burton and Philip Bowman to Heyden Chemical Corp.

Production of acyl aminosulfonic acids. No. 2,287,896. Henry Basel, Hans Zaeslin and Rudolf Hirt and Curt Glatthaar to J. R. Geigy A. G.

Process of treating a fluid containing a volatile amino base and a gaseous weak acid for selectively recovering said volatile amino base therefrom which comprises contacting said fluid at a temperature at which substantially only said volatile amino base is absorbed, with a liquid essentially comprising a substance selected from the group consisting of phenol, cresols, xylenols and mixtures thereof. No. 2,288,176. Hans Baehr.

Process of preparing acylated halogen alkyl amines. No. 2,288,178. Herbert Bestian to General Aniline & Film Corp.

Acrylic acid amides. No. 2,288,197. Georg Kranzlein and Martin Corell.

Ethers of mono-hydroxy-halogen-1 ,4-benzoquinones and a process of preparing them. No. 2,288,198. Gerhard Langbein to General Aniline & Film Corp.

Process for the production of beta-alkoxyaldehydes. No. 2,288,211. Hermann Schultz to Chemical Marketing Co., Inc.

Process for producing polyhydroxyarysulfones. No. 2,288,282. Johann Huismann to General Aniline & Film Co.

Phthalocyanine sulfonic acid chloride. No. 2,288,478. Friedrich Nadler, Cologne-Mulheim, Otto Bayer and Hans Hoyer to General Aniline & Film Corp.

Sulfonic acid amide compound. No. 2,288,530. Josef Klarer and Fritz Mietzsch to Winthrop Chemical Company, Inc.

Benzenesulfonamide compounds. No. 2,288,531. Josef Klarer to Winthrop Chemical Co.

Coatings

Sealing coating composition. No. 2,286,964. Robert T. Hucks to E. I. du Pont de Nemours & Co.

Coating composition and use thereof. No. 2,287,484. Louis Pereny and George A. Meising to The Sherwin-Williams Co.

Resinous coating composition. No. 2,287,986. Daniel Gowing and Philip Sanders to E. I. du Pont de Nemours & Co.

Corrosion resistant film on zinc. No. 2,288,007. John Lum to Westinghouse Electric & Mfg. Co.

Dyes, Stains

Vat dye composition for use in coloring cellulosic textile material. No. 2,286,262. Earl W. Clark to Allied Chemical & Dye Corp.

Azo dye. No. 2,286,304. Henry C. Olpin to Celanese Corp. of Amer.

Azo dyes. No. 2,286,391 and 2,286,392. Chiles E. Sparks to E. I. du Pont de Nemours & Co.

Coloring matter of the phthalocyanine type. No. 2,286,679. Isidor M. Heilbron, Francis Irving and Reginald P. Linstead to Imperial Chemical Industries, Ltd.

Diazotype printing material. No. 2,286,701. Georg Werner to Kalle & Co. Atkiengesellschaft.

Photographic element containing a trisazo dye. No. 2,286,714. Jonas J. Chechak to Eastman Kodak Co.

Azo compounds and material colored therewith. No. 2,286,795. Joseph B. Dickey and James G. McNally to Eastman Kodak Co.

Dye for color photography. No. 2,286,837 Merrill W. Seymour, Richard V. Young and Jonas J. Chechak to Eastman Kodak Co.

Fluoroarylaminoanthraquinone acid wool dyestuffs. No. 2,287,590. Alexander J. Wuerts, Henry R. Lee and Edwin Buxbaum to E. I. du Pont de Nemours & Co.

Manufacture of intermediates for dyestuffs. No. 2,287,647. Harvey I Stryker to E. I. du Pont de Nemours & Co.

Wool dyestuffs of the anthraquinone series. No. 2,288,219. Klaus Weinand to General Aniline & Film Corp.

Azo dyestuffs capable of being metallized. No. 2,288,518. Richard Fleischhauer and Adolf Muller to General Aniline & Film Corp.

Dyestuffs of the dioxazine series and process of preparing them. No. 2,288,522. Heinrich Greune and Max Thiele, Gerhard Langbein and Fritz Maennehen to General Aniline & Film Corp.

Equipment, Apparatus

Distillation column construction. No. 2,286,786. Harold Cloyd to Eastman Kodak Co.

Apparatus for determining the concentration of a constituent of a gas mixture. No. 2,286,985. Victor F. Hanson to E. I. du Pont de Nemours & Co.

Method and apparatus for determining the density of materials. No. 2,287,027. William F. Cummins, Jr.

Metal-vaporizing furnace. No. 2,287,038. Thomas R. Janes to Superior Zinc Corp.

Yarn processing apparatus. No. 2,287,517. Alvin L. Ewing to E. I. du Pont de Nemours & Co.

Mechanism for removing moisture from liquid products. No. 2,287,795. Joseph Hall to Drying & Concentrating Co.

Device for recovery of minerals. No. 2,287,804. Henry Johnson to Carl S. Halverson.

Chemical gas generator. No. 2,287,959. Charles C. Bailey.

Apparatus for forming dustless carbon black. No. 2,288,087. Hilding Hanson and Robert Skoog to United Carbon Co., Inc.

Fine Chemicals

Light-sensitive photographic emulsion comprising a silver hailide dispersed in a thermal-reversible gel composed of polyvinyl alcohol mixed with a gelling amount of an unsubstituted hydroxy aromatic compound selected from group consisting of the unsubstituted polyhydric phenols and unsubstituted dihydric naphthols. No. 2,286,215. Wesley G. Lowe to Eastman Kodak Co.

Mercurated aryl-alkyl ketones. No. 2,286,226. Anderson W. Ralston & Robert J. Vander to Armour & Co.

a-1-Napthyl cinnamic nitrile. No. 2,286,363. Ingenuin Hechenbleikner to American Cyanamid Co.

Photographic printing material and developer. No. 2,286,956. Oskar Sus to Kalle & Co. Atkiengesellschaft.

Methyl silicon halides. No. 2,286,763. Eugene G. Rochow to General Electric Co.

Photographic element containing a disazo dye. No. 2,286,838. Merrill W. Seymour and Jonas J. Chechak to Eastman Kodak Co.

Manufacture of adermin. No. 2,286,915. Richard Kuhn and Gerhard Wendt to Winthrop Chem. Co., Inc.

Rat-Pellagra preventing compounds and processes for their products. No. 2,287,042. John C. Keresztesy and Joseph R. Stevens to Merck & Co., Inc.

Organic amine derivatives and method of obtaining same. No. 2,287,071. Edward W. Tillitson to Parke, Davis & Co.

Process producing magnesium alcoholates. No. 2,287,088. Charles A Cohen to Standard Oil Development Co.

Preparation for promoting growth of plants. No. 2,287,102. Otto Isler to Hoffmann-La Roche Inc.

Homologues of dl-tocopherols. No. 2,287,106. Paul Karrer to Hoffmann-La Roche Inc.

Delta ^{2,6}-phytadienic acid and process for the manufacture of same. No. 2,287,107. Paul Karrer to Hoffmann-La Roche Inc.

Phosphoric acid dichlorides of compounds having a bactericidal action and process for the manufacture of same. No. 2,287,154. Kurt Warnat to Hoffmann-La Roche Inc.

Phosphoric acid dichlorides of 4-amino benzene sulfonamide and process for manufacture of same. No. 2,287,155. Kurt Warnat to Hoffmann-La Roche, Inc.

Octyl-halo-phenols. No. 2,287,443. Lindley E. Mills to The Dow Chemical Co.

Production of dextrine from starch. No. 2,287,599. August J. Bulfer and Clark C. Gapen to Corn Products Refining Co.

Antiseptic containing as an active ingredient thereof, a substance which in aqueous solution provides a cation having the type-formula R-Hg, where R is an alkyl. No. 2,287,724. Milton T. Bush to Mallinckrodt Chemical Works.

Direct conversion of alcohols to acids. No. 2,287,803. David Hull to Eastman Kodak Co.

Derivatives of i-cholesterol. No. 2,287,846. Everett Wallis and Erhard Fernholz to Merck & Co.

Dry pulverulent composition comprising zinc peroxide and a soluble ionizable compound of a heavy metal having more than one well-defined valency series of compounds and melting within the range of 1060-1480°C. No. 2,287,847. Thomas Webb to Merck & Co., Inc.

Vitamin E substitute and process of making it. No. 2,287,949. Lee Smith and Herbert Ungnade to Regents of the University of Minnesota.

Method of manufacturing ether alcohols. No. 2,288,181. Kurt Burgdorf, Herbert Frotscher and Hubert Machon to American Hyalsol Corp.

Local anesthetic compound selected from the group consisting of the gamma-di-n-butylaminopropyl ester of 3-amino-4-n-butyloxybenzoic acid and its acid addition salts. No. 2,288,334. Elmer Vliet and Marjorie Moore to Abbott Laboratories.

Process of preventing yellow fog in silver halide emulsions by treating the same with an organic compound. No. 2,288,586. Fritz Dersch and Newton Heimbach to General Aniline & Film Corp.

Industrial Chemicals

Production of ammonium thiocyanate. No. 2,286,273. Wm H. Hill to American Cyanamid Co.

Insecticidal composition comprising an organic thiocyanate and a synthetic ether compound. No. 2,286,222. Clarence L. Moyle and Fred W. Fletcher to The Dow Chemical Co.

Modified dicyandiamide condensation product. No. 2,286,228. Kurt E. Ripper to American Cyanamid Co.

Recovery of solid ferricyanides. No. 2,286,274. Wm. H. Hill to American Cyanamid Co.

As an article of manufacture, a body of organic hydrophilic material having incorporated therein an alkyl guanidine phosphate in sufficient quantity to render the article fireproof. No. 2,286,308. Charles M. Rosser to Sylvania Industrial Corp.

Barium salt of the pseudo acid of nitroamino-guanidine and method of preparing same. No. 2,286,327. Kenneth D. Ashley to American Cyanamid Co.

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Guanidine alkali metal ferricyanide. No. 2,286,330. Robert B. Barnes to American Cyanamid Co.

Method producing free cyanamide which includes steps of reacting in liquid ammonia an alkaline earth metal cyanamide with an ammonium salt having an acid racidal which forms a liquid ammonia-insoluble alkaline earth metal salt. No. 2,286,349. Harold S. Davis to American Cyanamid Co.

Guanyl urea salts of monoalkyl esters of sulfuric acid. No. 2,286,-364. David W. Jayne, Jr. and Harold M. Day to American Cyanamid Co.

Alkyl naphthylmethyl cyanamides. No. 2,286,380. Richard O. Roblin, Jr. to American Cyanamid Co.

Phenoxyacylamino derivatives. No. 2,286,390. Chiles E. Sparks to E. I. du Pont de Nemours & Co.

Process producing formic acid. No. 2,286,407. Paul Halbig to Lonza Elektrizitatswerke und Chemische Fabriken Aktiengesellschaft.

Method of dewatering hydraulic cement-making materials preparatory to burning them, comprising filtering said materials in the presence of a small quantity of finished cement not in excess of 1% calculated in dry weight basis. No. 2,286,420. Charles R. Jackson to Oliver United Filters Inc.

Reduction of inorganic oxidic compounds by silicon monoxide. No. 2,286,663. Eduard Zinti and Hans Grube.

N-alkenyl-aminophenol. No. 2,286,678. Ivan Gubelmann to E. I. du Pont de Nemours & Co.

Process of preparing thiuram sulfides. No. 2,286,690. Robert L. Sibley to Monsanto Chemical Co.

Preparation of dithiocarbamates. No. 2,286,738. Julian W. Hill to E. I. du Pont de Nemours & Co.

Coated alkaline article and process of making same. No. 2,286,767. Richard Stanley Shutt to E. I. du Pont de Nemours & Co.

Manufacture of sulfuric acid. No. 2,286,875. Herbert P. Scullin to United States Rubber Co.

Method of treating hydrolyzable titanium salt solutions. No. 2,286,-881. Foord Von Bichowsky to E. I. du Pont de Nemours & Co.

Method for making thymol. No. 2,286,953. Marion S. Carpenter to Burton T. Bush, Inc.

Purification of acetic acid. No. 2,286,995. Joseph S. Reichert, Arthur A. Elston and Roy Arthur Secord to E. I. du Pont de Nemours & Co.

Method making glass wool. No. 2,287,007. Dale Kleist and Games Slayter to Owens-Corning Fiberglas Corp.

Control of endothermic and exothermic reactions. No. 2,287,047. Lev A. Mekler to Universal Oil Products Co.

Process for production of alkali metal chlorates and more particularly potassium chlorate. No. 2,287,061. Sidney G. Osborne, Robert B. Lowry and Walter S. Beanblossom to Hooker Electrochemical Co.

Dry stable composition which yields in aqueous solution an oxidizing agent of high activity said composition comprising a solid inorganic peroxygen compound and an organic acid anhydride. No. 2,287,-064. Joseph S. Reichert, Samuel A. McHeight and Arthur A. Elston to E. I. duPont de Nemours & Co.

Synthesis of hydrocarbons. No. 2,287,092. Franz Duftschmid and Eduard Linckh and Fritz Winkler to Standard Catalytic Co.

Process purifying fatty acids. No. 2,287,128. Louis E. Pirkle to Jasco, Inc.

Liquid dirt solvents for eggs and process for applying same. No. 2,287,141. Ralph Webb Schofield.

Process of hydrogenating nitriles. No. 2,287,219. Hobart P. Young, Jr. and Carl W. Christensen to Armour & Co.

Production of carbon tetrachloride. No. 2,287,225. Joy E. Beanblossom to Hooker Electrochemical Co.

Catalytic composition. No. 2,287,244. Heinz Heinemann to Danciger Oil & Refineries Inc.

Polychlorinated benzyl phenyl ether selected from the class consisting of trichlorobenzyl phenyl ether, trichlorobenzyl o-tolyl ether trichlorobenzyl 2-acetyl phenyl ether, and trichlorobenzyl 4-tertiary-amyl phenyl ether. No. 2,287,249. Harold S. Holt to E. I. du Pont de Nemours & Co.

Preparation of monocalcium phosphate. No. 2,287,264. Sihon C. Ogburn, Jr. to General Chemical Co.

Process of separating lead and zinc sulfides. No. 2,287,274. Anderson W. Ralston and Ervin W. Wegebrecht to Armour & Co.

Preparation of potassium thiocarbonate. No. 2,287,285. Wallis R. Bennett to the Dow Chem. Co.

Stabilization of halogenated compounds. No. 2,287,421. Lawson Egerton to Bell Telephone Labs., Inc.

System of water purification and waste disposal. No. 2,287,427. Charles G. Hawley to Hawley Engineering Corp.

Preparation of aminomethyl ethers. No. 2,287,464. Louis H. Bock to Rohm & Haas Co.

Aminomethyl ethers of ether alcohols. No. 2,287,465. Louis H. Bock to Rohm & Haas.

Process for removing silicic acid from water. No. 2,287,486. Hellmuth Reichelt and Hans Zirngibl.

Purification of camphor. No. 2,287,522. Clyde O. Henke and Gastao Etzel to E. I. du Pont de Nemours & Co.

Process for preparing formyl diamines. No. 2,287,523. Alva L. Houk to Rohm & Haas Co.

Copolymerization of terpene hydrocarbons and coal tar hydrocarbons. No. 2,287,535. Paul O. Powers to Armstrong Cork Co.

Process for production of densely sintered ceramic masses. No. 2,287,538. Karl Schusterius to Rosenthal Isolatoren G.m.b.H.

Production of sulfur monochloride. No. 2,287,555. Wm. C. Klingelhoefer to The Solvay Process Co.

Manufacture of melamine. No. 2,287,597. Alfred Brookes to American Cyanamid Co.

Process for production of zein. No. 2,287,649. Lloyd C. Swallen to Corn Products Refining Co.

Method of halogenating cyclohexane. No. 2,287,665. Edgar C. Britton and Ralph P. Perkins to The Dow Chemical Co.

Purification of phosphoric acid. No. 2,287,683. Rudolph J. Hurka to Monsanto Chemical Co.

Process for reclaiming sulfuric acid. No. 2,287,732. Frederick E. Frey and Ralph C. Cole to Phillips Petroleum Co.

Process for the production of dicalcium phosphate. No. 2,287,758. Edward J. Fox.

Process for granulation of fertilizers. No. 2,287,759. John O. Hardesty, William H. Ross and Kenneth D. Jacob to Henry A. Wallace.

Parasiticidal composition comprising as a toxic ingredient an amino-acid ester salt of a phenol. No. 2,287,836. Frank Smith and John Hansen to Dow Chemical Co.

Purification of soda ash solutions. No. 2,287,856. Herman Beekhuis and Ernest Gaskins to The Solvay Process Co.

Treatment of titanium solutions. No. 2,287,861. L'Roche Bousquet and Maxwell Brooks to General Chemical Co.

In process for conditioning lead storage battery plates for use in storage batteries of the sulfuric acid type; the step of immersing the pasted plates in sulfuric acid solution having a specific gravity of between 1,320 and 1,774 in order to convert substantially all of the lead oxide to a basic lead sulfate. No. 2,287,868. Robert Daily to General Motors Corp.

Production of hydrocarbons and their derivatives from mixtures of hydrogen and oxides of carbon. No. 2,287,891. Eduard Linckh to Standard Catalytic Co.

Derivatives of phenols. No. 2,287,904. Reginald William Reynolds and Eric Everare Walker to Imperial Chemical Industries Ltd.

Process for treating proteinaceous material. No. 2,287,928. Francis Atwook to Atlantic Research Associates, Inc.

Manufacture of fluoro-hydrocarbons. No. 2,287,934. Aristid Grosse and Carl Linn to Universal Oil Products Co.

Antiskinning and weather resisting agent for drying oil compositions. No. 2,287,946. Harold Reynolds to Standard Oil Development Co.

Process for the recovery of nitric oxide from gaseous mixtures. No. 2,288,091. Kenneth Hoover to Commercial Solvents Corp.

Process of treating superphosphates. No. 2,288,112. Mark Shoeld to The Davison Chemical Corp.

Recovery of pure aromatics. No. 2,288,126. Clarence Dunn and Robert McConoughy to Shell Development Co.

Cement and cement manufacture. No. 2,288,179. Charles Breerwood to Valley Forge Cement Co.

Process for separating mixtures of chemically related substances. No. 2,288,281. Hendrik Huijser and Albert Schaafsma to Shell Development Co.

Process preparing chromium oxide gel catalysts. No. 2,288,320. Glen Morey to Phillips Petroleum Co.

Process for producing acrolein which comprises reacting acetylene with formaldehyde in the vapor phase in the presence of a condensation catalyst at temperatures above 150°C. No. 2,288,-335. Hans Walter, and Herman Schulz to Deutsche Gold-und Silber-Scheideanstalt vormals Roessler.

Process for production of ketones. No. 2,288,344. Benjamin Brooks to Standard Alcohol Co.

Purification and reconcentration of spent sulfuric acid. No. 2,288,-370. Chester Read to Standard Oil Development Co.

Condensation product of aryl amine and long chain aliphatic compound. No. 2,288,392. Garland David to Standard Oil Development Co.

Free-flowing salt composition. No. 2,288,409. Alfred Lippman, Jr. and Rock Comstock to Bay Chemicals Co., Inc.

Stabilization of peroxide. No. 2,288,410. Alfred Lippman, Jr. to Bay Chemical Co., Inc.

Manufacture of mixed phosphates. No. 2,288,418. Everett Partridge to Hall Laboratories, Inc.

Mixed ureas. No. 2,288,422. Alfred Rohm to General Aniline & Film Corp.

Process for refining animal and vegetable oils. No. 2,288,441. Frederick J. Ewing.

Process for the manufacture of phosphoric acid and its salts. No. 2,288,460. Jasper H. Kane and Harry G. Hansen to Charles Pfizer & Company.

Carbonization process for purifying sugar juice. No. 2,288,479. Alpheus R. Nees, Arthur N, Bennett and Edwin H. Hungerford to The Great Western Sugar Co.

Regeneration of catalysts by combustion. No. 2,288,484. John S. Rearick to The M. W. Kellog Co.

Concentration of potash ores. No. 2,288,497. Francis X. Tartaron, Allen T. Cole and James B. Duke to Phosphate Recovery Corp.

Process of working up complex ammoniacal solutions of metal. No. 2,288,547. Karl Pattock and Ehrhard Meier.

Process for the production of acrylic acid and its salts. No. 2,288,-566. Karl M. Herstein to Acrolein Corp.

Production of unsaturated compounds. No. 2,288,580. Hans Baehr and Wilheim Deiters.

Solvents for organic film-forming materials. No. 2,288,588. Alfred Rieche, Kreis Bitterfeld and Alfred Gneuchtel to General Aniline & Film Corp.

Metals, Alloys

Reissue. **Recovering Molybdenite** by froth flotation. No. 22,117. Thomas A. Janney, Alpha G. Johnson and Charles M. Nokes.

Alloy wrought iron and article made therefrom. No. 2,286,198. John W. Davis and Ray McBrian.

Manganese alloy. No. 2,286,199. Reginald S. Dean to Chicago Development Co.

Process for production of metallic magnesium. No. 2,286,209. Roy C. Kork to The Dow Chemical Co.

Copper powder, particles whereof have a surface alloy coating of copper with other metal more electropositive than copper melting between 200° and 500°C., the proportion of such other metal to the copper being of the order of about 0.25% to 1.00%. No. 2,286,237. John D. Shaw & Walter N. Revok to Metals Disintegrating Co., Inc.

Refining of nonferrous metals. No. 2,286,240. James R. Stack to Nassau Smelting & Refining Co., Inc.

Refining of nonferrous metals. No. 2,286,241. James R. Stack to Nassau Smelting & Refining Co., Inc.

Coating alloy. No. 2,286,333. Clinton Bowsher to The Artkraft Sign Co.

Process for froth flotation of sulfide ores. No. 2,286,374. Philip A. Ray to Hercules Powder Co.

Pyrometallurgical process for the production of pig-iron and ferrochromium. No. 2,286,577. Percy H. Royster.

Aluminum base alloy. No. 2,286,624. to 2,286,627. Louis W. Kempf and Walter A. Dean to Aluminum Co. of Amer.

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Alloy consisting of copper, cobalt and tin, the cobalt and tin each comprising an appreciable quantity but less than 2% by weight of said alloy. No. 2,286,734. Richards H. Harrington to General Electric Co.

Process for heat treating metal articles. No. 2,286,745. Herman A. Liebhafsky to General Electric Co.

Magnesium base alloy containing from about 0.1 to 0.7% of cerium, from 0.05 to 0.5% of calcium from 3 to 7% of cadmium, and from about 1.5 to 2.5% of manganese, the balance being magnesium. No. 2,286,866 to 2,286,870. John C. MsDonald to The Dow Chemical Co.

Surface treatment of magnesium and magnesium alloys. No. 2,287,049 and 2,287,050. Mike A. Miller to Aluminum Co. of Amer.

Aluminum bronze containing compositions. No. 2,287,053. Dean Murphy to Chadeloid Chem. Co.

Method for producing chromium-bearing alloys. No. 2,287,073. Marvin J. Udy.

Process for production of iron powder of great reactivity which comprises electrolyzing a ferrous chloride solution containing ammonium chloride at a current density of 6-7 amperes per dem.^{2} in the presence of formic acid in such a quantity that the pH value of the solution lies between 6.5 and 7.2. No. 2,287,082. Karl Bauer to Chemical Marketing Co. Inc.

Process of concentrating ores. No. 2,287,115. Sibley B. McCluskey.

Compound or alloy for coating welds. No. 2,287,227. Clinton Bowsher to The Artkraft Sign Co.

Manufacture of nonporous metal articles. No. 2,287,251. William D. Jones.

Process of producing high permeability silicon steel. No. 2,287,466. Victor W. Carpenter to The American Rolling Mill Co.

Process of producing silicon steel. No. 2,287,467. Victor W. Carpenter and John M. Jackson to The American Rolling Mill Co.

Method of carburizing without deterioration of furnace alloys. No. 2,287,651. John J. Turin to General Properties Co., Inc.

Process which comprises electroplating copper from a solution containing the double cyanide of copper and an alkali metal, at least 1 oz. per gallon of an alkali metal sulfocyanide and a small amount of a soluble carbohydrate. No. 2,287,654. Christian J. Werlund, Harry L. Benner and Robert R. Bair to E. I. du Pont de Nemours & Co.

Ferrotitanium alloy. No. 2,287,712. Jerome Strauss and Holbert E. Dunn to Vanadium Corp. of Amer.

Production of powdered alloys. No. 2,287,771. Peter Alexander.

Alloy composed of manganese, copper, nickel and aluminum, the aluminum being between 0.1% and 10%, the nickel being between 0.5% and 10%, and the copper being between 1% and 35%, the remainder being manganese, the manganese percentage being at least 50%. No. 2,287,888. William Droll to Electro Metallurgical Co.

Indium plating. No. 2,287,948. Clarence Smart to General Motors Corp.

Process for concentrating phosphate ores. No. 2,288,237. Ernest Greene to Phosphate Recovery Corp.

In process for electrodeposition of zinc, the step comprising depositing zinc from a cyanide-zinc bath in the presence of a bath-soluble addition agent prepared by reacting materials consisting of a phenol and an aldehyde to produce a phenol-aldehyde condensation product. No. 2,288,318. Raymond A. Hoffman to E. I. du Pont de Nemours & Co.

Recovery of zinc values. No. 2,288,405. Raymond Kepfer to E. I. du Pont de Nemours & Co.

Method of surface treating objects of cast magnesium base alloys. No. 2,288,552. Gustav Siebel and Eduard Nachtgall.

Paints, Pigments

Titanium oxide pigment production. No. 2,286,882. Foord Von Bichowsky and Robert M. McKinney to E. I. du Pont de Nemours & Co.

Titanium pigment and process for producing same. No. 2,286,910. Marion L. Hanahan and Robert M. McKinney to E. I. du Pont de Nemours.

Production of improved pigments. No. 2,287,416. Curtis M. Dann to E. I. du Pont de Nemours & Co.

In process for producing an improved extender material the steps which comprise taking a calcite ore comprising iron disulfide said ore being in form of a coarse powder and heating it at a temperature between about 425°C. and about 550°C. to develop magnetic susceptibility and thereafter passing it through a magnetic separator. No. 2,287,440. Ray L. McCleary to E. I. du Pont de Nemours & Co.

Alkali-resistant iron blue pigment. No. 2,288,309. Edwin Wilson and Irving Shack to Interchemical Corp.

Electroylic basic metal chromate pigment manufacture. No. 2,288,503. Elbert F. Weaver to Internation Smelting & Refining Co.

Paper, Pulp

A safety paper containing a leuco derivative of a triphenylmethane dye. No. 2,288,147. Burgess Smith to The Todd Co., Inc.

Petroleum

Alkylation of isoparaffinic hydrocarbons. No. 2,286,183. Wm. E. Bradley and Karl J. Korpi to Union Oil Co. of Calif.

Process for producing paraffinic hydrocarbons. No. 2,286,184. Wm. E. Bradley and Karl J. Korpi to Union Oil Co. of Calif.

Process acid refining viscous hydrocarbon oil with the production of acid sludge characterized by its ready plumpability. No. 2,286,343. Vladimir L. Checot to The Atlantic Refining Co.

Process refining hydrocarbon oils. No. 2,286,344. Vladimir L. Chechot to Atlantic Refining Co.

Method purifying used lubricating oil. No. 2,286,369. James R. Miller to Bocjl Corp.

Catalytic conversion of hydrocarbon oils. No. 2,286,447. Charles L. Thomas to Universal Oil Products Co.

Treatment of hydrocarbons. No. 2,286,475. Gustav Egloff and Charles G. Dryer to Universal Oil Products Co.

Process for alkylation of isoparaffins. No. 2,286,504. Earrand D. Parker to Union Oil Co. of Calif.

Isomerization of normal paraffinic hydrocarbons. No. 2,286,542. Heinz Heinemann to Danciger Oil & Refineries, Inc.

Alkylating hydrocarbons. No. 2,286,543. Heinz Heinemann to Danciger Oil & Refineries, Inc.

Oxidation of alicyclic ketones. No. 2,286,559. Sumner H. McAllister to Shell Development Co.

Treatment of oil wells. No. 2,286,724. Allen D. Garrison to The Texas Co.

Manufacture of motor fuel. No. 2,286,814. Lebbeus C. Kemp to The Texas Co.

Method of recovering adsorbent materials. No. 2,286,815. Wynkoop Kiersted Jr. to The Texas Co.

Solvent deasphalting and dewaxing. No. 2,286,823. Wallace A. McMillan to The Texas Co.

Solvent extraction of petroleum. No. 2,286,852. Melvin M. Holm to Standard Oil Co. of Calif.

Catalyst. No. 2,287,022. Robert E. Burk and Everett C. Hughes to the Standard Oil Co.

Lubricating oil comprising a waxy hydrocarbon oil and a condensation product of a ketone having carbocyclic and open chain aliphatic radicals of at least 6 carbon atoms with a short chain dihalo aliphatic hydrocarbon of 1 to 6 carbon atoms. No. 2,287,110. Eugene Lieber to Standard Oil Development Co.

Process for removing organic sulfur compounds of the mercaptan type from a mineral oil boiling in the range between 100 and 700°F. comprising treating same at atmospheric pressure and at a temperature in the range from 60 to 85°F. with an aqueous solution of an aliphatic amino alcohol. No. 2,287,118. August Y. Mottlau to Standard Oil Development Co.

Process removing soluble impurities from a hydrocarbon product which comprises bringing the hydrocarbon product into contact with a solid adsorbent for such impurities said adsorbent being wetted with a substantially pure low molecular weight aliphatic alcohol. No. 2,287,119. Albert J. Mueller to Standard Oil Development Co.

Oxidation of low molecular weight hydrocarbons in liquid phase and catalyst therefor. No. 2,287,125. John J. Owen and Paul T. Parker to Standard Oil Development Co.

Fractionation of hydrocarbons. No. 2,287,355. Albert Ramsey Nevitt to Bradford Penn Refining Corp.

Method preserving a cracked hydrocarbon distillate which tends to deteriorate and develop gum on storage, which method comprises incorporating in said distillate a trace of a napthol, less than .1% sufficient to substantially retard such deterioration and gum formation. No. 2,287,359. Thomas H. Rogers and Vanderveer Voorhees to Standard Oil Co.

Process of making asphalt which comprises heating with temperature rise to 350-400°F. and thickening a petroleum residuum in the absence of injected air to asphalt-consistency with a small amount of an aluminum chloride catalyst. No. 2,287,511. Robert E. Burk and Charles H. Whitacre to The Standard Oil Co.

Process of demulsification of water-in-oil emulsions comprising treating the emulsion with a solution consisting of naphthalene and phenol in a dispersing liquid in which these materials and the oil of the emulsion are mutually miscible. No. 2,287,567. Grover C. Porter.

Conversion of hydrocarbons. No. 2,287,672. Frank C. Fannestock to Socony-Vacuum Oil Co., Inc.

Process for dewaxing waxy oil. No. 2,287,730. Seymour W. Ferris to The Atlantic Refining Co.

Production of motor fuels by solvent extraction. No. 2,287,736. Arthur B. Hersberger to The Atlantic Refining Co.

Motor fuel products consisting substantially entirely of cracked hydrocarbon distillates of the character of gasoline which tends to deteriorate and develop gums on storage, said product containing a small proportion of beta-naphthylamine such that its tendencies to deteriorate and develop gums are appreciably inhibited. No. 2,287,898. Jacque Morrell to Universal Oil Products Co.

An improved lubricating oil comprising a viscous hydrocarbon containing a waxy distillation residue of a product prepared by the condensation of an acid chloride of a carboxylic acid having a molecular weight of more than 200. No. 2,287,901. Mathias Pier and Friedrich Christmann to Standard Catalytic Co.

Manufacture of catalytic material. No. 2,287,917. Charles Thomas and Joseph Danforth to Universal Oil Products Co.

Hydrocarbon conversion. No. 2,287,918. Maynard Venema to Universal Oil Products Co.

Process for increasing the anti-knock value and boiling range of a paraffinic hydrocarbon fraction containing hydrocarbons of less than 6 and hydrocarbons of at least 6 carbon atoms in straight chain arrangement. No. 2,287,931. Ben Corson and George Monroe to Universal Oil Products Co.

Treatment of hydrocarbons. No. 2,287,935. Aristid Grosse and William Mattox to Universal Oil Products Co.

A hydrocarbon oil conversion process. No. 2,287,940. Edwin McGrew to Universal Products Co.

Process for dewaxing mineral oils. No. 2,287,966. David G. Brandt to Cities Service Oil Co.

Hydrocarbon conversion process. No. 2,288,070. Morris Carpenter to Standard Oil Co.

Manufacture of motor fuel. No. 2,288,262. Harold V. Atwell to Gasoline Products Co., Inc.

Lubricant comprising in combination a major proportion of an oil of lubricating viscosity and a minor proportion of diethylarsenic phenylstearate. No. 2,288,288. Bert Lincoln to Socony-Vacuum Oil Co., Inc.

Purification of petroleum contaminated waters. No. 2,288,330. Ralph Stevenson.

Apparatus for purifying petroleum oil. No. 2,288,333. Dan Vinson to Mechanical Oil Recovery, Inc.

Catalytic reforming of naphthas. No. 2,288,336. Albert Welty, Elizabeth and Stephen Perry to Standard Catalytic Co.

Cracking with water soluble catalyst. No. 2,288,395. Carleton Ellis to Standard Oil Development Co.

Method of treating diesel fuel. No. 2,288,401. Stewart Hulse and John Collins to Standard Oil Development Co.

Separating Hydrocarbon Fluids. No. 2,288,453. Luther R. Hill to The M. W. Kellog Co.

Separating Hydrocarbon Fluids. No. 2,288,461. Percival C. Keith, Jr., and George Roberts, Jr., to The M. W. Kellog Co.

Production of isobutane. No. 2,288,477. Charles W. Montgomery to Gulf Research & Development Co.

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Resins, Plastics

Hardenable composition for making printing plates comprising a plurality of cellulose acetate esters of differential viscosity, a resinoid, a small quantity of a volatile solvent to render the mass workable, the composition having a viscosity substantially greater than 10 seconds. No. 2,286,220. Ralph H. McKee.

Interpolymers and preparation of same. No. 2,286,251. Harold W. Arnold to E. I. du Pont de Nemours & Co., Inc.

Clear and transparent plastic composition comprising an interpolymer of methyl-alphachloroacrylate with vinyl acetate, said interpolymer, containing from 10 to 30% of vinyl acetate. No. 2,286,264. John W. C. Crawford and Nancy McLeish to Imperial Chemical Industries, Ltd.

Oil acid-modified polyhydric alcohol-polybasic acid resin. No. 2,286,466. Edwin T. Clocker.

Molding compositions from naturally occurring cellulosic materials and method for preparing same. No. 2,286,643. Ralph O. Phillips and Ernst H. W. Rottsieper to The Forestal Land, Timber and Railways Co. Ltd.

Resinous product, soluble in dilute acid and insoluble in dilute alkali and water, of the condensation, with alcohol evolution, of an amine wherein each nitrogen is attached only to members of class consisting of aliphatic carbon and hydrogen, wherein there is at least one hydrogen on amino nitrogen and wherein the molecule, apart from amino nitrogen and hydrogen attached thereto is hydrocarbon with a condensation product of formaldehyde an urea and an alcohol. No. 2,286,752. Charles J. Mighton to E. I. du Pont de Nemours & Co.

Reissue. **Urea resins** and acid treatment thereof. No. 22,124. Carleton Ellis to Ellis Foster Co.

Method stabilizing vinyl aromatic resins against light. No. 2,287,188. Lorne A. Matheson and Raymond F. Boyer to the Dow Chemical Co.

Stable compositions containing vinylidene chloride polymeric products. No. 2,287,189. Lorne A. Matheson, Raymond F. Boyer and Gerald H. Coleman to Dow Chemical Co.

Resinous product and method of manufacturing. No. 2,287,351. Robert W. Martin to Hercules Powder Co.

Resin manufacture. No. 2,287,352. Robert W. Martin to Hercules Powder Co.

Hardenable urea-formaldehyde condensation product mixed with about 10% of melamine, also a hardenable urea-formaldehyde condensation product mixed with 2-5% of a melamine salt. No. 2,287,756. Alfred Brookes to American Cyanamid Co.

Plastic composition comprising a cellulose acetate base combined with a urea formaldehyde resin, said resin bein in proportion between 5 and 40% by weight of cellulose acetate. No. 2,287,930. Ralph Canter to General Motors Corp.

Superpolyamide-formaldehyde reaction product. No. 2,288,279. Heinrich Hopff and Hanns Ufer to E. I. du Pont de Nemours and Co.

Production of condensation products. No. 2,288,306. Hans Wagner to the Chemical Marketing Co., Inc.

Polymerizable composition comprising a diallyl ether and an unsaturated alkyd resin. No. 2,288,315. Gaetano D'Alelio to General Electric Co.

Composition of matter capable of being hot-molded and ejected hot from the mold and containing a filler and the reaction product of an acidic alkyd resin having an acid number of at least 125 and an active oxide of a polyvalent metal in an amount substantially in excess of 25 per cent by weight based on the weight of the alkyd resin. No. 2,288,321. Birger Nordlander and Ira Hurst to General Electric Co.

Moldable copal composition and method of making the same. No. 2,288,322. Birger Nordlander to General Electric Co.

Process for the production of artificial resins. No. 2,288,533. Ignaz Kreidl and Franz Nozicka to Eridolin Glass (Style Vereinigte Chemische Fabriken Kreidl, Heller & Co.)

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Rubber

In process of making gas expanded closed cell rubber structures, the step of gassing the rubber with a non-oxidizing mixture of carbon dioxide and nitrogen. No. 2,286,230. Dudley Roberts and Roger C. Bascom to Rubatex Products, Inc.

Process for producing a fire-resistant rubber composition having good electrical insulating properties. No. 2,286,697. Harold A. Tunstall and Benjamin B. Evans to W. T. Henley's Telegraph Works Co. Ltd.

In degrading of rubber from waste rubber products the step of subjecting the rubber product to a temperature of from about 210°C. to about 245°C. by the application of heated aqueous vapor directly thereto. No. 2,287,095. Albert G. Federman.

Material for making vulcanized rubber articles comprising a shaped rubber composition having embedded therein a fabric, the weft yarn of which fabric comprise fusible synthetic resin that becomes ineffective at vulcanization temperatures. No. 2,287,139. George Schneider to Celanese Corp. of Amer.

Process for making closed-cell cellular rubber. No. 2,287,193. Robert L. Overstreet to Salta Corp.

Rubber composition comprising rubber and a suitable quantity of finely divided precipated calcium silicate having an average particle size not substantially in excess of about one micron, the molecular ratio of SiO_2 to CaO in said silicate being not less than about 2 to 1. No. 2,287,700. Irving E. Muskat and Frederick Gage to Pittsburgh Plate Glass Co.

Rubber Flooring or sheeting. No. 2,287,766. Carroll C. Davis to Boston Woven Hose & Rubber Co.

Rubberlike materials. No. 2,287,773. Reginald Bacon, William Baird, Bernard Habgood and Leslie Budworth Morgan to Imperial Chemical Industries Ltd.

Rubberlike materials. No. 2,287,774. Reginald Bacon, Bernard Habgood and Rowland Hill to Imperial Chemical Industries Ltd.

Method of making sponge rubber. No. 2,288,190. Marion Harrison to B. F. Goodrich Co.

Vulcanization of rubber. No. 2,288,194. Paul Jones and Roger Mathes to B. F. Goodrich Co.

Rubber composition having high flex-resistance and low hysteresis. No. 2,288,195. Paul Jones and Warren Phillips to The B. F. Goodrich Co.

Textiles

Yarn treating process. No. 2,286,791. Joseph B. Dickey and James G. McNally to Eastman Kodak Co.

Yarn conditioning process and composition therefor. No. 2,286,792. Joseph B. Dickey and James G. McNally to Eastman Kodak Co.

Yarn conditioning process and composition therefor. No. 2,286,793. Joseph B. Dickey and James G. McNally to Eastman Kodak Co.

Yarn conditioning process and composition therefor. No. 2,286,794. Joseph B. Dickey to Eastman Kodak Co.

Yarn treating. No. 2,286,824. James G. McNally and Joseph B. Dickey to Eastman Kodak Co.

Manufacture and production of artificial threads and the like articles. No. 2,286,962. Horace J. Hegan and John H. Givens and Leslie Rose to Courtaulds Ltd.

Process of preparing a mixed solution of keratin and viscose for manufacture of artificial material by coagulation. No. 2,287,028. Angelo D'Ambrosio and Arnaldo Corbellini.

Process producing a wool-like product which comprises spinning a filament from a molten synthetic fiber-forming polyamide, wetting the filament with a mild swelling agent, partially cold drawing the wet filament, releasing tension thereon, and drying the relaxed filament to remove the swelling agent. No. 2,287,099. Vernal R. Hardy and John B. Miles, Jr., to E. I. du Pont de Nemours & Co.

Process of spinning. No. 2,287,839. Johann Joseph Stoeckly to North American Rayon Corp.

Production of effects on artificial materials. No. 2,287,932. Henry Ewing to Celanese Corp. of Amer.

Viscose spinning solution. No. 2,288,106. Elmar Prófft to North American Rayon Corp.

Process of finishing a textile fabric which includes treating the fabric with a dispersion containing a glycol ester of a rosin, said ester having a melting point within the range of about 35° to about 70°C., removing excess dispersion from the fabric and drying the fabric at a suitable temperature. No. 2,288,432. Wyly M. Billing to Hercules Powder Co.

Abstracts of Foreign Patents

Collected from Original Sources and Edited

Those making use of this summary should keep in mind the following facts:

Belgian and Canadian patents are not printed. Photostats of the former and certified typewritten copies of the latter may be obtained from the respective Patent Offices.

English *Complete Specifications Accepted* and French patents are printed, and copies may be obtained from the respective Patent Offices.

In spite of present conditions, copies of all patents reported are obtainable, and will be supplied at reasonable cost.

This digest presents the latest available data, but reflects the usual delays in transportation and printing. Your comments and criticisms will be appreciated.

CANADIAN PATENTS

Granted and Published August 26, 1942 (*Cont'd*)

Detonating blasting explosive free from self-explosive sensitizers, comprising particles of ammonium nitrate and a vegetable cellular carbonaceous ingredient (such as cork meal) bound together to form a granular agglomerate. No. 398,875. Imperial Chemical Industries, Limited. (James Taylor and Vernon H. Williams).

Process of producing a rubber conversion product comprising reactlar carbonaceous ingredient (such as cork meal) bound together to liquid cresol in the presence of hydrogen chloride, the cresol being present in at least approximately 75 parts by weight to 100 parts by weight of the rubber. No. 398,879. Marbon Corporation. (James P. McKenzie).

Method of producing finely divided alkaline earth sulfite precipitates for use in the paper industry, which comprises vigorously agitating an aqueous medium containing sucrose in solution and an alkaline earth reaction product while adding to the medium a sulfite gas which reacts with the alkaline earth reaction product to form a water insoluble, alkaline earth sulfite precipitate. No. 398,886. Paper Patents Company. (J. Glenn Strieby).

Method of preparing a nitrato hypophosphite which comprises the admixing of unsaturated solutions of a nitrate and a relatively soluble hypophosphite, the precipitation and removal of a relatively insoluble hypophosphite, the evaporation of the remaining liquor to saturation and the precipitation and removal of a nitrato hypophosphite. No. 398,888. Remington Arms Company, Inc. (Willi Brun).

Process for absorption of nitrosyl chloride and reaction thereof with a metal chloride to form an addition compound, comprising contacting the nitrosyl chloride with an aqueous solution of the metal chloride containing sufficient free hydrochloric and nitric acids to substantially prevent hydrolysis of the nitrosyl chloride. No. 398,889. The Solvay Process Company. (Herman A. Beekhuis, Jr).

Wax composition comprising an emulsion of wax in water having therein as an emulsifier a morpholine compound with a fatty acid of high molecular weight. No. 398,894. Universal Chemical Company. (Homer C. Brumbaugh).

Process and apparatus for coating both surfaces of flexible sheeted materials including paper and the like with mobile coating compositions. No. 398,895. S. D. Warren Company. (Lindsay O. Goff and Frederick H. Frost).

Extract from bacteria which contains the active components of the bacteria in substantially genuine form. No. 398,903. Winthrop Chemical Company, Inc. (Carl Ludwig Lautenschlager and Fritz Lindner).

Process of stabilizing and homogenizing a hormone preparation which comprises suspending a preparation of the gonadotropic hormone of the anterior lobe of the hypophysis in physiologically innocuous oil, said oil having an admixture of wool fat in an amount not exceeding 15% calculated on the quantity of oil employed. No. 398,904. Winthrop Chemical Company, Inc. (Herman Friedrich).

Process for the treatment of liquid milk, particularly in the preparation of cow's milk humanized for infant feeding, comprising adding vitamin C (ascorbic acid) to the milk substance, sealing the substance in liquid form in a container, air and light being excluded from the substance between such addition and sealing, and sterilizing the milk substance sealed in the container. No. 398,919. The Canned Cream & Milk Co. Aktieselskab and Peder Kock Henriksen. (Peder K. Henriksen).

Granted and Published September 2, 1941.

Process for the production of sulfanilamide. No. 398,924. Morris S. Kharasch and Otto Reinmuth.

Printing plate presenting water-receptive areas comprising a polyvinyl alcohol. No. 398,926. William C. Toland and Ellis Bassist.

Process of purifying compositions of the class characterized by native salt, native borax and byproduct chloride of lime, said compositions containing insoluble earthy constituents as impurities. No. 398,928. Thomas Patterson Campbell and William Beless Jacobsen.

Method of reducing or digesting ores comprising heating the material in a closed vessel under pressure in the presence of pregenerated acid fumes while exposing a limited portion of gases produced in the process to a cooling medium for condensation and for reduction of the pressure in the vessel, and returning the condensed vapors directly to the portion of the vessel in which the reaction is taking place. No. 398,963. Richard K. Moreland.

Apparatus for rapidly drying printing ink deposited on a running paper web. No. 398,965. Bernard Offen.

Paper sizing composition comprising paraffin, rosin, starch, a soap and water, in the form of an emulsion. No. 398,980. American Cyanamid & Chemical Corporation. (Joe F. Shuman).

Method of crystallizing a solute from a solution thereof in a solvent which includes decreasing its solubility therein by varying the vapor pressure of the solution with respect to a fluid above the solid solution, which fluid is soluble in said solvent. No. 398,981. American Cyanamid Company. (William H. Hill).

Process for recovery of bismuth from alkaline bismuthide dross by decomposing the dross in the presence of water to yield finely-divided elemental bismuth in the form of a liquor containing practically the entire bismuth content of the original dross, subjecting the liquor and decomposition residue to a classifying operation to separate the liquor from at least the major part of the residue, and separating the bismuth from the liquid component of the liquor. No. 398,982. American Smelting and Refining Company. (Jesse O Betterton and Yurii E. Lebedeff).

In the process of smelting copper in a reverberatory furnace, constantly inhibiting the passage of the upper portion of the slag layer from the smelting zone into the settling zone. No. 398,983. American Smelting and Refining Company. (Richard A. Wagstaff).

Foundry mold having a facing consisting principally of a fine granular material of the class consisting of zirconia and zirconium silicate bonded with cement. No. 398,993. Bidrsboro Steel Foundry and Machine Company. (John H. Hall).

Foundry mold having a facing consisting principally of fine granular high alumina aluminum silicate bonded with cement. No. 398,994. Birdsboro Steel Foundry and Machine Company. (John H. Hall).

Foundry mold having a facing consisting principally of fine granular titanium dioxide bonded with cement. No. 398,995. Birdsboro Steel Foundry and Machine Company. (John H. Hall).

Method of regenerating spent lead solution containing lead sulfide comprising treating the solution with a material generating hydrogen peroxide and agitating the solution with air. No. 398,997. Buffalo Electro-Chemical Company, Inc. (Virden W. Wilson).

Process for producing finely divided insoluble anhydrite. No. 398,999. Canadian Industries Limited. (Roy W. Sullivan).

Process for the preparation of a colored photographic image in a gelatino-silver halide emulsion layer. No. 399,000. Canadian Kodak Company, Ltd. (Karl Schinzel).

Method of dispersing titanium pigment in aliphatic alcohols and ketones which comprises intimately mixing a titanium pigment with a liquid selected from the group consisting of liquid aliphatic alcohols and ketones in admixture with a small amount of a tannic acid composition. No. 399,004. Canadian Titanium Pigments Limited. (Walter W. Plechner and Joseph M. Jarmus).

Abrasive article comprising diamond particles distributed at substantial intervals in a mass of metallic particles which are closely packed against each other and against the diamond particles and which have an aggregate mass equal to several times that of the diamond particles, and a resinous bond interconnecting the diamond particles and the metallic particles. No. 399,005. The Carborundum Company. (Albert L. Ball).

Process for the manufacture of a new green triazo dyestuff. No. 399,006. Chemical Works formerly Sandoz. (Heinrich Lier).

Process of producing substantive polyazo dyestuffs comprising coupling a diazotized disazo-dyestuff of the general formula $A\text{-}N{=}N\text{-}M_1\text{-}N{=}N\text{-}M_2\text{-}NH_2$ in which A represents an acid radical of the benzene and naphthalene series, and M_1 and M_2 represent two radicals of the benzene and naphthalene series, each bearing the 2 nitrogen atoms linked directly therewith in 1:4-position, with a 2-aroylamino-6-hydroxynaphthalene-8-sulfonic acid, the aroyl radical of which being selected from the group consisting of benzoyl and substituted benzoyl radicals. No. 399,018. J. R. Geigy A. G. (Adolf Krebser).

Process of purifying oil or fat comprising removing metallic impurities by adding hydrochloric acid, separating such metallic impurities, adding alkali to neutralize free fatty acids and hydrochloric acid, thereby forming soapstock, separating the soapstock from the oil or fat, adding a natural oil-soluble anti-oxidant concentrate prior to the step of hydrogenating whereby the stability of the oil to resist rancidity is increased. No. 399,020. General Mills, Inc. (Alonzo E. Taylor and Jakob L. Jakobsen).

Both for electrodepositing cuprous oxide containing in solution copper compounds in which the copper is in the cupric state, and cupric ions, characterized by the bath also containing initially provided micelles or nuclei comprising cuprous oxide, from the presence of which the bath has as an operating characteristic, the deposition of cuprous oxide at a low initial single-electrode voltage. No. 399,027. Kansas City Testing Laboratory. (Jesse E. Stareck).

Process for the manufacture of soap products which comprises incorporating sodium soaps with salts of the group consisting of ortho-

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phosphoates and polyphosphates of the alkali metals and producing products in a form in which they will rapidly dissolve in water. No. 399,028. Lever Brothers & Unilever Limited. (Richard Thomas and Henry B. Oakley).

Process for the manufacture of soaps or soap products in a form which will insure rapid solution in water, in which the soaps are derived from fatty acids containing from 10 to 30% of saturated acids having more than 18 C atoms in the molecule, at least 30% of unsaturated acids and not more than 30% of palmitic or of a mixture of palmitic and stearic acids whereof the stearic acid does not exceed about 15% of the total fatty acids in the soap, any other unsaturated acids present being of lower molecular weight than palmitic acid. No. 399,029. Lever Brothers & Unilever Limited. (Richard Thomas and Henry B. Oakley).

Process of aging calcined gypsum including agitating the gypsum, exposing the gypsum to a moisture carrying gaseous agent having a predetermined relative humidity, and continuing the agitation and exposure until rehydration of the gypsum by the moisture content of the gaseous agent to the hemihydrate is effected. No. 399,037. National Gypsum Company. (Frank L. Marsh and Dudley C. Chads).

Process of making a compound pigment which consists in coating particles of an extender selected from the group comprising barium sulfate, zinc sulfide and mixtures of barium sulfate and zinc sulfide with not more than 2% by weight of titanium dioxide deposited on the particles of extender before calcination. No. 399,040. Orr's Zinc White Limited. (William E. Ireland and Herbert Mills).

Process for the production of hetropolar compound from an unsaturated ketone by rearranging an alpha beta unsaturated ketone to the isomeric beta gamma unsaturated ketone, hydrogenating the beta gamma unsaturated ketone to a secondary alcohol, and reacting said alcohol with a sulfating agent. No. 399,049. Shell Development Company. (Franklin A. Bent).

A capillary-active composition comprising a solution of a sulfate of a pyridine base having a lipophile group containing at least seven carbon atoms in an aliphatic chain attached to a carbon atom of the heterocyclic ring, and an excess of free sulfuric acid. No. 399,050. Shell Development Company. (Johan P. Wibaut and Johan Overhoff).

Process for the conversion of normal and branched-chain saturated hydrocarbons to branched and more highly branched-chain saturated hydrocarbons. No. 399,051. Shell Development Company. (Willem F. Engel).

Process for thhe recovery of metals from fuel comprising separating the flue ash particles from the flue gases into finer and coarser portions, recycling said coarser portion to the combustion space and thereafter recovering the metal values from said finer portions. No. 399,052. Shell Development Company. (Hendrik J. J. Janssenn.)

A homogeneous smooth floor wax substantially free from ozokerite, capable of yielding a glossy finish which is hard but neither sticky nor slippery, comprising a mixture of waxes, a major portion of which consists of paraffin wax, and a solution of 3-15% of an oil-soluble resin in a substantially tar-free viscous mineral oil having a viscosity at 100°C of not less than 2° Engler. No. 399,053. Shell Development Company. (August Schneider).

Polymerization of low boiling olefine hydrocarbon by means of a solid phosphoric acid catalyst comprising contacting said hydrocarbons with said phosphoric acid catalyst under polymerizing conditions in the absence of free oxygen. No. 399,054. Shell Development Company. (William P. Gage and Richard M. Deanesly).

Process for the manufacture of derivatives of chrysene comprising causing halogen substitution products of the chrysene to react with amino substitution products of vatable compounds which contain at least one hydrogen atom in the amino group. No. 399,058. Society of Chemical Industry in Basle. (Walter Kern and Richard Tobler).

Process for the manufacture of acyl derivatives of azo dyestuffs. No. 399,059. Society of Chemical Industry in Basle. (Franz Ackermann).

Method for determining the character of coffee comprising determining the oxidizability of roasted coffee by contacting coffee with oxygen under controlled time, humidity and temperature conditions, and measuring the amount of oxygen absorbed. No. 399,060. Standard Brands, Inc. (William R. Johnston).

Working fluid for an absorption refrigerating system comprising a volatile hydrogen-containing halogenated aliphatic hydrocarbon as a refrigerant and an ester of a phosphoric acid and low molecular weight aliphatic alcohol as the absorbent. No. 399,074. Williams Oil-O-Matic Heating Corporation. (Michael J. Copley).

Working fluid for an absorption refrigerating system which includes methylene chloride as a refrigerant and an absorbent comprising a liquid disubstituted polyglycol derivative. No. 399,075. Williams Oil-O-Matic Heating Corporation. (Glenn F. Zellhoefer).

Process comprising adding to a solution of a substance liable to decompose when being sterilized by heat, a member of the group consisting of salts of weak acids and strong bases and salts of strong acids and weak bases before subjecting the solution to the sterilization process. No. 399,076. Winthrop Chemical Company, Inc. (Josef Eisenbrand and Hermann Picher).

Process comprising adding to a substance in solution, liable to decomposition within a pH region above 5, a small amount of urea and an acid and then subjecting the solution to the sterilization process. No. 399,077. Winthrop Chemical Company. (Josef Eisenbrand and Hermann Picher).

Rodenticide acting as a stomach poison comprising as carrier for the poison used a water soluble cellulose derivative selected from the group consisting of methyl cellulose and hydroxyalkylated celluloses. No. 399,078. Winthrop Chemical Co., Inc. (Paul Herzig and Hans Kukenthal).

Method of making an anhydride of an aliphatic acid by subjecting the anhydride to a preliminary purification, separating the crude anhydride by distillation from a still into first runnings, a middle portion and tailing distillates, and fractionating the middle portion in a reflux condensing system distant from the condensing system used for removing the first runnings and tailings but attached to the same still, to recover the purified anhydride. No. 399,083. Camille Dreyfus. (Clifford I. Haney).

Stiffened non-crepe fabric comprising yarns containing an organic derivative of cellulose, said yarns having a set twist of a twist coefficient of from 320 to 480. No. 399,084. Camille Dreyfus. (Herbert Platt).

Process for producing a moldable hydrolyzed vegetable fibrous material with a predetermined cellulose-lignin ratio. No. 399,087. Carlile Patterson Winslow. (Ernest Bateman, Earl C. Sherrard, Edward Beglinger and John P. Hohf).

Apparatus for detecting the presence of dangerous gases. No. 399,088. Inez L. Cragin, Chester W. Johnson and Richard N. Dresser. (Inez L. Cragin and Chester W. Johnson).

Placer metal recovery apparatus. No. 399,089. Cornelius A. (Rolfson).

Method and apparatus for the manufacture of carbon tetrachloride from charcoal and chlorine using sulfur as a catalyst. No. 399,095. I. G. Farbenindustrie A. G.

Laminated fabric comprising areas which have elastic extensibility in one direction and areas which have relatively no elastic extensibility in such direction. No. 399,096. International Latex Processes, Limited. (Merwyn C. Teague and Thomas G. Hawley, Jr).

Process of coating fabrics with rubber using heat-sensitive fluid latex. No. 399,097 International Latex Processes, Limited. (Harold C. Tingey).

Process for improving the nutritional value of cereals. No. 399,099. Erich Gustav Huzenlaub.

Process of manufacturing kola chocolate including the step of adding to the chocolate mass a kola nut product and a coffee product. No. 399,102. Albert Rinne.

Granted and Published September 9, 1941.

Method for removing from chromium alloy steel the mill scale formed during commercial production and fabrication thereof. No. 399,103. Samuel Joseph Blaut and Harold Martin Lang.

Wound dressing adapted to be pressed into an open bleeding wound for arresting the flow of blood comprising a soft resilient compressible pad of pineapple fibre impregnated with an oleaginous agent in a loosely grouped form. No. 399,113. Robert Edwin Cornish.

Insecticidal and insectifugal compounds comprising the group of organic chemical compounds characterized as gamma-substituted-alpha, gamma-diketo carboxylic acid esters wherein the gamma substitutions are aralkyl or aliphatic groups having more than one carbon atom useful as insecticides and insectifuges. No. 399,114. Lowell B. Kilgore.

Machine of the rectilinear type for the combing of textile fibers. No. 399,125. John William Nasmith.

Method for the recovery of heat from gas mixtures containing at least one permanent gas and at least one condensable gas or vapor. No. 399,126. Johan Olof Nauclér.

Process for the production of a porous material from comminuted ceramic material. No. 399,127. Joseph R. Parsons.

Means for exhausting gases from a vertical kiln or furnace. No. 399,129. Charles Frederick Priest.

A chlorobenzotrifluoride which is stable to atmospheric conditions and boils above 200°C. No. 399,159. Canadian Industries Limited. (Lee C. Holt and Herbert W. Davdt).

Method of removing iron from high alumina materials which includes heating the material to a temperature of 900-1150°C. while excluding air and passing through and over the material the vapor of a chloride of the group consisting of silicon tetrachloride, aluminum chloride and titanium tetrachloride. No. 399,170. Corning Glass Works. (Martin E. Nordberg).

Method of manufacturing finely comminuted oxides which includes hydrolizing a hydrolyzable compound dissolved in a non-aqueous liquid medium comprising at least one liquid in which water is substantially insoluble, by introducing water into the solution and thereafter filtering the product. No. 399,171. Corning Glass Works. (Dan McLachlan, Jr.)

Acetylene generator. No. 399,173. Dominion Oxygen Company Limited. (Maurice P. DeMotte).

Apparatus for safely conveying finely divided material between the interior of a combustible gas generator and a point outside such generator. No. 399,174. Dominion Oxygen Company Limited. (Maurice O'Brien).

Nozzle for flame machining having at least two oxidizing gas passages for discharging a plurality of independent oxidizing gas streams having different cross sectional areas, one of said passages having a substantially rectangular outlet. No. 399,175. Dominion Oxygen Company Limited. (Herbert E. Serner).

Process for improving the color of a material darkened by presence of iron or iron compounds comprising subjecting the material in an aqueous suspension to the reducing action of a reducing agent to reduce substantially all iron present to the ferrous state and reacting the reduced iron with a ferricyanide. No. 399,176. The Dow Chemical Company. (Sidney D. Wells).

Process for the production of acetate silk textile materials having crepe-like effects which comprises forming the material with acetate silk fibers and with other fibers unaffected by shrinking agents for acetate silk and then treating the material with shrinking agents for acetate silk. No. 399,180. Farberei-und Appretur-Gesellschaft vorm. A. Clavel und Fritz Lindenmeyer. (René Clavel and Theophil Stanisz).

Sintered porous metal element having a completely sponge-like physical structure, said element being made from non-compacted metal powder and comprising minute intercommunicating pores therein, and bodies of solid lubricant mechanically held within said pores and substantially completely filling the same. No. 399,182. General Motors Corporation. (Roland P. Koehring).

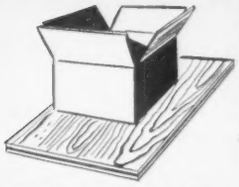
Storage battery plate of the pasted lead type adapted for use in a sulfuric acid electrolyte having active material incorporating therein small quantities of a nickel salt of substantially pure lignin sulfonic acid as derived from lignin in hard wood. No. 399,183. General Motors Corporation. (Robert A. Daily and William C. Pritchard).

Mass adapted for the conversion of hydrochloric acid and the like into chlorine free from hydrochloric acid, including as elements thereof a chlorine carrier, a depressant for such carrier, a reaction booster and a porous, inert support. No. 399,184. Wm. M. Grosvenor Laboratories, Inc. (William Mason Grosvenor, Jr. and Isidor Miller).

Process of concentrating mica by froth flotation which comprises pulping the ore with water, mixing therein alkali resinate, and subjecting the pulp to a froth flotation treatment. No. 399,204. Phosphate Recovery Corporation. (Francis Xavier Tartaron and Leslie Roth Harrison, Jr.).

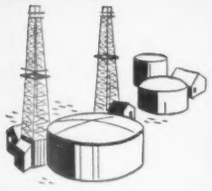
Additional Canadian Patents Granted and Published September 9, 1941 will be given next month.

FOR HARDENING AND WATER-PROOFING CONCRETE

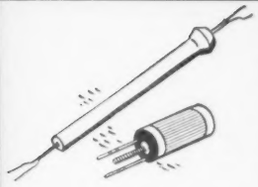


IN THE MANUFACTURE OF PAPER, FIBREBOARD, CONTAINERS AND PLYWOOD

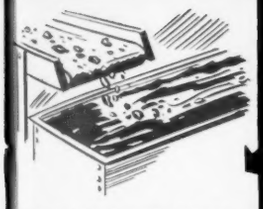
SODIUM SILICATE



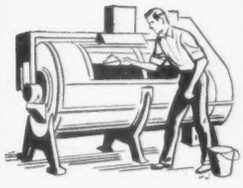
IN THE MANUFACTURE OF CATALYSTS FOR THE OIL INDUSTRY



AS AN INSULATING MATERIAL IN ELECTRICAL PRODUCTS



FOR THE FLOTATION OF ORE IN MINING OPERATIONS



FOR IMPROVING DETERGENT ACTION OF LAUNDRY SOAPS

FOR DRYING AIR IN AIR-CONDITIONING SYSTEMS

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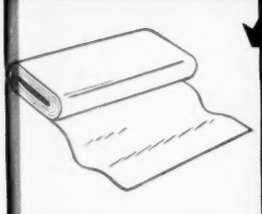

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